Undergraduate Bulletin

SANTA CLARA

1989-1990

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Santa Clara University extends equal employment and educational opportunity to all people regardless of race, sex, creed, color, religion, national origin, age, marital status, sexual preference, source of income, or handicap. This policy is in accordance with objectives set forth by federal statutes and presidential executive orders.

SANTA CLARA UNIVERSITY

Undergraduate Courses and Degrees 1989–90 Bulletin

Santa Clara, California 95053

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Academic Calendar 1989–90

FALL QUARTER 1989

May 1–31	Monday–Wednesday	Advance registration, Fall 1989
September 16–19	Saturday–Tuesday	New-student orientation
September 19	Tuesday	New-student registration/add period
September 20	Wednesday	Instruction begins
September 20–26	Wednesday–Tuesday	Late registration; add period
September 26	Tuesday	Last day to declare P/NP grading option
October 13	Friday	Last day to submit incomplete spring quarter and summer session 1989 work to professors
October 20	Friday	Last day to petition for degrees to be conferred in December 1989
October 20	Friday	Last day to withdraw from classes without a W grade
October 20	Friday	Final day to remove spring quarter 1989 incompletes (faculty)
November 13–21	Monday–Tuesday	Advance registration, Winter 1990
November 17	Friday	Last day to withdraw from classes
November 22	Wednesday	Academic holiday
November 23–24	Thursday–Friday	Thanksgiving recess; academic and administrative holidays
December 1	Friday	Classes end
December 4–8	Monday–Friday	Fall quarter examinations
December 22–25	Friday–Monday	Christmas recess; administrative holidays
December 29–January 1	Friday–Monday	New Year's recess; administrative holidays

WINTER QUARTER 1990

November 13–21	Monday–Tuesday	Advance registration, Winter 1990
January 3	Wednesday	New-student registration
January 3	Wednesday	Instruction begins

January 3–9	Wednesday–Tuesday	Late registration/add period
January 9	Tuesday	Last day to declare P/NP grading option
January 15	Monday	Martin Luther King Day; academic and administrative holiday
January 26	Friday	Last day to submit incomplete fall quarter 1989 work to professors
January 26	Friday	Last day to petition for degrees to be conferred in March 1990
February 2	Friday	Final day to remove fall quarter 1989 incompletes (faculty)
February 2	Friday	Last day to withdraw from classes without a W grade
February 19	Monday	Presidents' Day; academic and administrative holiday
February 20–28	Tuesday–Wednesday	Advance registration, Spring 1990
February 23	Friday	Last day to petition for degrees to be conferred in June 1990
March 2	Friday	Last day to withdraw from classes
March 9	Friday	Classes end
March 12–16	Monday–Friday	Winter quarter examinations

SPRING QUARTER 1990

February 20–28	Tuesday–Wednesday	Advance registration, Spring 1990
March 26	Monday	New-student registration
March 26	Monday	Instruction begins
March 26–30	Monday–Friday	Late registration/add period
March 30	Friday	Last day to declare P/NP grading option
April 12	Thursday	Last day to submit incomplete winter quarter 1990 work to professors
April 13	Friday	Good Friday; academic and administrative holiday
April 20	Friday	Last day to petition for degrees to be conferred in August 1990

April 20	Friday	Final day to remove winter quarter 1990 incompletes (faculty)
April 20	Friday	Last day to withdraw from classes without a W grade
April 30–May 14	Monday–Monday	Advance registration, Fall 1990
May 25	Friday	Last day to withdraw from classes
May 28	Monday	Memorial Day; academic and administrative holiday
June 1	Friday	Classes end
June 4–7	Monday–Thursday	Spring quarter examinations
June 9	Saturday	139th Commencement

SUMMER SESSION 1990

June 1–18	Friday–Monday	Registration period, summer session 1990
June 18	Monday	Instruction begins
July 4	Wednesday	Independence Day; academic and administrative holiday
July 27	Friday	Classes end
July 30–31	Monday–Tuesday	Summer session examinations

All dates are inclusive.

1

Santa Clara University

STATEMENT OF PURPOSE

Inspired by the love of God to serve through education, begun by the Franciscans who founded Mission Santa Clara in 1777 and continued by the Jesuits who opened the College in 1851, Santa Clara University declares its purpose to be the education of the human person within the Catholic and Jesuit tradition.

The University is thus dedicated to

- a community of highly qualified scholars, teachers, students, and administrators bound to an uncompromising standard of academic excellence;
- an education that, in its emphasis on undergraduate studies and its pursuit of selected high-quality graduate and professional programs, stresses moral as well as intellectual values, an education of the whole person, an education seeking to answer not only "what is" but "what should be";
- an academic community informed by Catholic principles, a community offering its members the opportunity for worship and for deepening their religious perception, yet a community enriched by men and women of diverse religious and philosophical as well as social and racial backgrounds, a community opposed to narrow indoctrination or proselytizing, a community wherein freedom of inquiry and freedom of expression enjoy the highest priority;
- an integrated curriculum designed not only to provide the scientific and humanistic knowledge necessary to enable students to become fully human, but also to demonstrate the unity of all forms of knowledge and to enable students to assume leadership in the modern world;
- the encouragement of teaching excellence and of the scholarly research that promotes such excellence, of close student-teacher relationships, of experimental and innovative courses and teaching methods—courses and methods that stimulate not only the acquisition of knowledge but also the creative use of knowledge;

- an academic community in which students, teachers, and administrators dedicated to academic freedom and united in the search for truth actively formulate and carry into effect the University's policies.

Board of Trustees
Santa Clara University
January 22, 1975

HISTORICAL PERSPECTIVE

On January 12, 1777, six months after the signing of the Declaration of Independence, a cross was planted at a site in the present city of Santa Clara by a Spanish Franciscan missionary, Tomás de la Peña, to mark the founding of the eighth of California's original 21 missions, Santa Clara de Asís.

Three-quarters of a century elapsed before Santa Clara University, or Santa Clara College as it was known, opened its doors as an institution of higher learning. In the intervening years, however, the mission served as a spiritual center and school for the Indians. Besides religious instruction, the men were taught stockraising, farming, and the building trades; the women, weaving and sewing; the boys, reading, music, and religious drama. From 1777 until Mexican government secularization on February 27, 1837, some 9,000 persons were baptized at the mission.

During the early period, the less solidly built mission buildings of the first and second sites were destroyed by the flooding waters of the Rio Guadalupe. The third mission church, constructed of adobe, was completed in 1784 but was seriously damaged by earthquakes in 1812 and 1818. A fourth church, also adobe, was used temporarily from 1819 to 1825. The larger, fifth adobe mission with its quadrangle patio, was completed and dedicated August 12, 1825. The University's Adobe Lodge Faculty Club is all that remains of the west wing of that quadrangle.

The first site of Mission Santa Clara is marked by a California state historical landmark located near the intersection of Kifer Road and De La Cruz Boulevard. Crosses mark the second site at De La Cruz Boulevard and Martin Street and the third site at Campbell and Franklin streets. The temporary fourth mission church stood between what are now Kenna Hall and the Walsh Administration Building.

During the first three decades of the nineteenth century, the old mission enjoyed its most fruitful years. In 1827, well over 1,400 Indians lived within sound of the mission's bells. In that year, some 15,000 sheep, 14,500 head of cattle, and abundant crops of wheat, corn, and beans were produced and cared for by the Indians under the guidance of the missionaries.

A combination of factors terminated the decades of prosperity at Santa Clara and the other California missions. The Mexican War of Independence brought turmoil from 1810 to 1821 and resulted in a decrease in Franciscan personnel and donations-in-aid from benefactors. The new Mexican government took possession of the old Jesuit Pious Fund of the Californias that had been the main source of support for the mission. Most of the Indians' lands, cattle, and sheep became the object of spoliation by civil administrators.

In 1827 and again in 1829, governmental decrees ordered exile for all Spaniards who refused allegiance to the new regime. Since most of the mission padres were from Spain, many chose banishment. Some, however, remained until 1833, when Mexican Franciscan replacements arrived from the missionary college of Zacatecas. Among them was Fray Francisco García Diego y Moreno, who was to become the first bishop of the Californias. Although committed to the welfare of the Indians, the padres' resistance to governmental encroachment on the Indians' rights and property had little effect. Full secularization of mission properties was finally imposed at Mission Santa Clara in early 1837. This action ended the effectiveness of the Franciscan missionary endeavor in Alta California. Within a few years, most of the mission buildings and the Indian lands, cattle, and sheep were seized by civil officials and other claimants. In the early 1840s, foreigners began arriving in Alta California in increasing numbers. Some of the immigrants were Anglo-Americans attracted by the rich agricultural lands of the Santa Clara Valley.

Events of the year 1848 dramatically altered the course of history at Santa Clara. In February the United States and Mexico signed the Treaty of Guadalupe Hidalgo, which concluded the two-year war in which they had been engaged and ceded California to the United States. That same year gold was discovered in the Sierra Nevada, thus attracting a flood of newcomers into the former Mexican province.

It was in this setting that Santa Clara opened its classroom doors in May 1851. The new Bishop of San Francisco, Joseph Sadoc Alemany, asked Jesuits Michael Accolti and John Nobili, formerly Oregon missionaries, to open a college at Mission Santa Clara. During its first academic year, 1851–52, Father Nobili and a handful of Jesuit and lay teachers offered instruction in a variety of subjects to approximately 40 students. A decision made in 1854 by the Jesuit Province of Turin, Italy, to adopt California as a permanent mission field marked a turning point in Santa Clara's history. As a consequence, the Jesuits of Turin provided the college with the faculty and support that it needed to grow. The following year, Santa Clara College received a charter of incorporation from the state of California.* In 1857, the college conferred its first collegiate degree, a Bachelor of Arts diploma, on Thomas I. Bergin. This was the first diploma granted by any institution of higher learning in the state of California. By 1858, new scientific apparatus arrived from Paris, and integrated courses in science as well as in the classics and in commercial subjects were offered.

Slow and steady growth followed, and distinguished graduates became prominent members of California life. It was not until 1912, however, that the Schools of Law and Engineering were founded. In that same year, courses in the humanities and the sciences were expanded, and the college became Santa Clara University. Meeting the demands of urban growth in the Santa Clara Valley, courses in commerce and finance were also expanded in 1926, and the University's School of Business and Administration began. In that same year,

*THE UNIVERSITY'S LEGAL NAME is *The President and Board of Trustees of Santa Clara College* to which should be added, *A Corporation, located at Santa Clara, California.* For the information of individual, corporation, and foundation donors who wish the tax benefits of their gifts and grants, the University is classified by the Internal Revenue Service as a 501 (c) (3) (ii) tax-exempt organization and it is not classified as a private foundation under section 509 (a) of the IRS Code.

the old mission church was destroyed by fire. The present structure, an enlarged replica of the original, was completed in 1928.

From the 1930s through World War II, the University's enrollment was relatively stable. The return of many veterans resulted in an enlarged student body and new resources. In 1947, for the first time in the University's history, enrollment broke the 1,000 mark. From the postwar period to the present, the face of the campus has been changing and expanding. In 1961, the University announced a major change in policy and accepted women as undergraduate students for the first time in its 110-year history. Santa Clara became the first Catholic coeducational institution of higher learning in California. Thanks to the generous support of many friends, 23 new buildings have been added to match the growth in enrollments. Still newer facilities—the Louis B. Mayer Theatre, Leavey Activities Center, and Cowell Student Health Center—were completed in the early 1970s.

Although the student body has grown rapidly in the past decade, it has been held relatively small: 3,700 undergraduates and 4,000 graduate and law students. Since 1960, the number of courses taught has more than doubled, and educational opportunities at all levels have increased.

As an independent University supported by tuition and gifts, Santa Clara has been able to accomplish change in ways that reflect its traditional concern for the individual student.

Today, Santa Clara University, the first institution to offer classes in higher learning on the West Coast, continues its mission heritage of service by helping its students equip themselves with advanced knowledge and humanistic values. Academic excellence in a well-balanced human being is the University's goal.

CAMPUS LOCATION

Santa Clara University is 46 miles from San Francisco, near the southern tip of the Bay, in an area rich in opportunities for learning. The campus is situated in the midst of one of the nation's great concentrations of high-technology industry and professional and scientific activity. Many nearby firms and social agencies are world leaders in the search for solutions to man's most critical problems. The cultural and entertainment centers of San Francisco, Berkeley, Oakland, and Marin County are within one-hour's travel by bus, train, or car. In the opposite direction, the Pacific beaches of Santa Cruz are about 30 minutes away; the world-famous Monterey Peninsula and Carmel are two hours away.

The University is accessible by major airlines via San Jose International Airport, which is three miles from campus, and via San Francisco and Oakland International airports.

Santa Clara has a moderate Mediterranean climate. Over a period of 67 years, the average maximum temperature was 71.4 degrees and the average minimum, 41.6 degrees. The sun shines an average of 293 days per year, and the average annual rainfall is about 15 inches.

ACADEMIC ORGANIZATION

The University is organized into five academic units.

The College of Arts and Sciences comprises three divisions—Arts and Humanities, Mathematics and Natural Sciences, and History and Social Sciences—and offers 28 majors leading to either the Bachelor of Arts or the Bachelor of Science degree. In addition, the Department of Music offers a Bachelor of Music in Performance degree. The College also provides the liberal arts curriculum to all undergraduate students in the University.

The Thomas and Dorothy Leavey School of Business and Administration offers a professional education in both undergraduate and graduate programs. The Executive Development Center, an integral part of the school, offers nondegree seminars, lectures, and programs for professional managers and executives. The graduate programs are described in *Leavey School of Business and Administration Graduate Programs.*

The School of Engineering offers a technical education in both undergraduate and graduate programs. The graduate programs are described in *School of Engineering Graduate Programs.*

The School of Law offers a full range of courses in federal, state, and international law that leads to the J.D. degree. The *School of Law Bulletin* describes its programs.

The Division of Counseling Psychology and Education offers programs in various areas of counseling and education. *Division of Counseling Psychology and Education Graduate Programs* describes its programs.

ACADEMIC TERMS

The academic year (September to June) is divided into three eleven-week terms. The eleventh week is devoted to examinations. Most undergraduate courses in the College of Arts and Sciences and the Leavey School of Business and Administration carry 4 units of academic credit and students typically enroll in four courses per quarter. During some quarters of their junior and senior years, students may enroll in three courses. In the School of Engineering, course values range from 3 to 5 units each; consequently, the number of courses taken varies. Most classes are scheduled on Monday, Wednesday, and Friday with 65 minutes per class period or Tuesday and Thursday with 105-minute class meetings. Science and engineering labs are scheduled in the afternoons and on Tuesday and Thursday mornings.

SUMMER SESSION

The six-week summer session offers day and evening courses for college credit. Undergraduate courses are offered in a number of academic disciplines. No transcript is required for admission, but all applicants must be in good academic standing. Students with advanced placement credit who have finished the eleventh grade may enroll in freshman-level courses. Room and board are available on campus at reasonable rates.

Graduate courses are also offered in the Leavey School of Business and Administration, the School of Engineering, the School of Law, and the Division of Counseling Psychology and Education. Course information may be obtained from the individual schools.

2

Admissions

ADMISSION TO FRESHMAN STANDING

Criteria

The University makes selective decisions regarding applicants for admission based on the following criteria: first, high school record; second, scores on College Entrance Examination Board tests; third, school recommendations; fourth, personal factors such as extracurricular involvement, character, and leadership; fifth, relationship to the University.

Admission to freshman standing at Santa Clara depends on a continued high level of performance during the remainder of the applicant's senior year in high school and on receipt of a high school diploma. If a significant change occurs in academic work during this year, the Committee on Admissions will reevaluate the acceptance in light of that change.

Recommended Courses

The following high school courses are recommended for a student applying for admission to the University as a freshman:

	Number of Units		
Course	*Liberal Arts Majors*	*Business and Social Science Majors*	*Natural Science, Mathematics, and Engineering Majors*
Algebra	2	2	2
English	4	4	4
History	1	1	1
Foreign language (one)	3	3	3
Plane geometry	1	1	1
Laboratory science (upper division)	1	1	2*
Trigonometry		½	½
Elective**	4	3½	2½

*Physics and chemistry are recommended laboratory sciences for natural science and engineering majors.

**Elective courses must be in advanced foreign languages, mathematics, laboratory science, or other solid college-preparatory courses.

Campus Visits

The University encourages every candidate to visit the campus, preferably when school is in session so the candidate can tour the campus with a student guide.

Although interviews are not required, a member of the admissions staff will be happy to meet with candidates. Appointments should be made in advance.

Admissions Procedure

Prospective freshman students should

1. File the application and service fee of $30.00 with the Admissions Office, Santa Clara University (application forms may be obtained from that office);
2. Submit a recommendation from the high school counselor, evaluating scholastic ability and character, to the Admissions Office (recommendation form is provided with application);
3. Request the high school to forward a sixth-semester transcript to the Admissions Office;
4. Take the Scholastic Aptitude Test (SAT) no later than January of the senior year and request that scores be sent to the University. For information on dates and places of this test, write to the College Board, ATP, 1947 Center Street, Berkeley, California 94704, or Box 592, Princeton, New Jersey 08541;
5. Make certain all the above are completed and the required materials are submitted to the Admissions Office by February 1. Full consideration cannot be assured for applications received after that date;
6. Mail application materials directly to the Admissions Office.

Sixth-Semester Decision

Students may seek an admissions decision after the sixth semester. Transcripts reflecting six semesters of work and recommendation forms should be sent by the high school. The decision concerning admissions will be rendered beginning in December. If the Committee on Admissions feels that additional academic information is required before reaching its final decision, the student will be so informed in a letter.

ADVANCED PLACEMENT

Santa Clara participates in the Advanced Placement program to grant recognition of college-level academic achievement prior to matriculation and to encourage students to pursue advanced studies in their areas of interest.

Credit or placement is determined on the recommendation of the appropriate department, which will review the student's scores and may also review the student's high school record, teacher evaluations, substantiation of independent studies, and transcripts from other colleges. Course credit is offered to students who qualify in subjects according to the schedule issued by the

University registrar. Students will be notified of such credit on matriculation at Santa Clara.

Subjects in which credit may be granted include

American government and politics
American history
Art history
Biology
Calculus (two courses)
Chemistry
Comparative government and politics
Computer science
English composition and literature
English language and composition
European history
French language
French literature
German language
German literature
Latin (two courses)
Music (two courses)
Physics (three courses)
Spanish language
Spanish literature
Studio art (two courses)

ADMISSION TO ADVANCED STANDING (TRANSFERS)

Each year the University accepts a number of transfer students, principally at the sophomore and junior levels. Since applications exceed the number of students who can be accommodated, no specific statement can be made about the quality of work (GPA) that will enable a transfer applicant to be accepted. Only students in good standing at the last college attended will be considered. No student on academic or disciplinary probation or suspension will be considered for admission.

Ordinarily, there is no minimum number of units required for transfer admission. However, students who were not accepted as freshmen cannot be considered until they have completed at least 45 quarter units or 30 semester units of transferable college work. In general, students' class standing is determined by the number of units applicable to their degree program.

The Scholastic Aptitude Test of the College Entrance Examination Board and a high school transcript are required of transfer applicants who have completed less than 45 quarter units or 30 semester units of transferable work.

Transfer students may apply for admission for fall, winter, and spring quarters. Deadlines for applications to those terms are fall, May 1; winter, November 1; spring, February 1.

Transfer Credit

Transfer credit is determined by the dean of the College or School following the student's acceptance and submission of registration deposit. No evaluation will be made before that time. The following general statements apply to transfer credit:

- Santa Clara University awards transfer credit to students who have completed, with a grade of C or better, courses taken at other accredited four-year universities and colleges. The academic levels of these courses must be essentially equivalent to those of similar courses offered at Santa Clara and

typically exclude courses or credit gained from continuing education or from practica or internships (i.e., experiential learning).

- Courses from accredited two-year institutions are generally transferable if they are similar to courses listed in the Santa Clara University *Undergraduate Bulletin,* under the same conditions, and if (in California community colleges) they are designated as University of California transferable. A maximum of 90 quarter units (60 semester units) of academic work, passed with a grade of C or better, taken at a community (two-year) college may be accepted for transfer credit toward a degree at Santa Clara. Work done at other institutions will not be used in calculating grade point averages or class rankings at Santa Clara.
- Courses of a technical or trade nature do not transfer. Courses from regionally unaccredited institutions, trade schools, and extension or correspondence programs do not transfer.
- Students who are already enrolled at Santa Clara University and who intend to take courses at other institutions, either while on academic leave or during the summer months, are strongly urged to have these courses approved in advance by the chair of the major department and by the dean of their college. In this way, the selection of nontransferable courses can be avoided. Appropriate approval forms are available from the Student Records Office.

ADMISSION OF FOREIGN STUDENTS

Foreign students must present a score in the Test of English as a Foreign Language (TOEFL), which is administered by the Educational Testing Service. The minimum acceptable TOEFL score is 550. Foreign students, both freshmen and advanced-standing applicants, must also take the Scholastic Aptitude Test of the College Entrance Examination Board. In order to be issued Immigration Form I-20, the applicant must be accepted as a full-time student working toward a degree.

3

Financial Services

EXPENSES 1989–90

Application fee **$30.00**
This charge is to be sent with each application form and is not refundable.

Deposits

All new students or students reapplying for admission **$200.00**
This amount is automatically credited to the student's account when paid and is not refundable.

Housing prepayment **$200.00**
The $200 deposit must accompany the housing contract. The deposit is refundable on a prorated basis according to the schedule stipulated in the Student Housing Contract.

Tuition and fees per quarter **$3,206.00**

Incremental tuition (per course) **$66.00**
For students taking Engineering courses

Part-time tuition

One (1) term course **$1,076.00**
Two (2) term courses (lower-division students) **$1,989.00**
Two (2) term courses (upper-division students) **$3,206.00**
Upper-division students enrolled for at least two (2) courses, regardless of the unit value of the courses, are considered full-time students for tuition purposes and will be charged full-time tuition.

Co-op administrative fee **$250.00**

Room and board per quarter **$1,562.00***
The amount stated above is for the 19 meal plan rate of $649 and the standard residence hall (two persons per room) rate of $913. Please note that any other housing or meal plan arrangement

*New students will be assessed an early board and/or room charge for the fall orientation program, assessed as follows:
Resident freshman/transfer student $65.00
Nonresident freshman student $33.00
Nonresident transfer student $18.00

will result in a different rate than stated above. Charges during winter and spring recess are by arrangement with the director of Housing and Residence Life.

Note: Tuition and room and board are due and payable in full no later than the announced financial clearance deadline.

Fees

Fee for challenging a course (per course) **$50.00**
Late registration fee **$30.00**
Late submission of form fee (administrative forms, e.g., application for degrees, etc., per day; $50 maximum) **$2.00**
Fee for replacement of damaged identification **$5.00**
Fee for replacement of lost identification **$15.00**
Deferment service fee **$50.00**
Returned check fee **$10.00**
Studies Abroad service fee **$30.00**
Transcript of grade fee (per copy) **$2.50**
Transcript of grade fee (rush process) **$7.50**
Graduation fee **$40.00**

Note: For graduate programs in Business and Administration, Religious Studies, Counseling Psychology and Education, Engineering, Law, and summer session tuition and fees, see announcements of the various graduate programs and summer sessions.

Registration Cancellation Fee If a student, after registering, withdraws anytime prior to the first scheduled day of classes and before attending any classes, the full refund is subject to a $50 registration cancellation fee.

Biology Laboratory Courses A $15 fee will be charged for each lab course to cover the cost of supplies.

Chemistry Laboratory Courses Breakage costs will be charged at the completion of each course. A $15 fee for each lab course will be charged at the time of registration.

Special Information A full-time student who drops courses after the last day to add classes will be considered full-time for the balance of that term for tuition purposes.

Part-time Students For tuition purposes, a part-time student is defined as a lower-division student taking fewer than three (3) term courses or an upper-division student taking fewer than two (2) courses, regardless of the unit value of the course. For financial aid purposes, 6 units is the minimum number of units to be considered enrolled at least half time.

Parking Permits Permits may be purchased daily between 8:00 a.m. and 5:00 p.m. at the Public Safety Office. Permit fees are $20 per year or $10 per quarter.

Damages Charges for loss or damage in residence halls, to other University property, and to special equipment will be billed directly to the student and parents on report of damage or loss.

PAYMENT PROCEDURES FOR RETURNING STUDENTS

The University requires payment in full of tuition and room and board by the announced financial clearance deadline. All payments are to be sent to the following address:

Office of Student Accounts
Santa Clara University
P.O. Box 44783
San Francisco, CA 94144–4783

Prior to each financial clearance deadline, the Office of Student Accounts will send a bill itemizing the amount due for the quarter. The student and/or parent should check the bill to see if the proper charges have been assessed for tuition and room and board. If errors or omissions are noted, such items should be corrected on the bill and the amount due adjusted accordingly.

Payment for all charges is due on or before the announced financial clearance (payment) deadline. Registration will not be considered complete and will be canceled unless payment in full is received or a formal deferment of payment is obtained from the Office of Credit and Collection by this deadline.

Students who have unpaid accounts at the University or who defer payment without approval are subject to dismissal from the University and, as long as such accounts are outstanding, will not be issued academic transcripts or diplomas.

PAYMENT PROCEDURES FOR INCOMING FRESHMEN AND TRANSFER STUDENTS

The University requires payment in full of tuition and room and board on or before registration day. Prior to registration, payment instructions will be mailed to the permanent address regarding costs and payment deadlines. These payment procedures apply only to the first quarter at Santa Clara University. After the first quarter, students will be billed for the next academic term.

TWELVE-MONTH BUDGET PAYMENT PLAN

The University offers a Twelve-Month Budget Payment Plan for families who prefer to pay required tuition and room and board on a monthly basis. Monthly payments under this plan begin in June. More information and participant coupons are available from the Student Accounts Office.

Families who do not choose to use the Twelve-Month Budget Payment Plan may either pay all charges by the financial clearance deadline or take advantage of one of several deferred payment plans administered by others. Families who

plan to use one of these other plans should complete the details with the sponsoring agency at least six weeks prior to registration. The names and addresses of these agencies are available from the Student Accounts Office.

GUARANTEED TUITION PLAN

The Guaranteed Tuition Plan is a payment plan whereby families may prepay up to four years of tuition. The University guarantees that the student's tuition rate will not increase over the prepaid period. Payment of the required prepaid tuition and mandatory fee amount may be made in the following ways:

1. A lump sum payment from the family's own resources
2. A loan in the prepaid amount from a commercial lender

REFUND OF TUITION

The date on which written notification of withdrawal is received at the Student Accounts Office will be the effective date on which any refund of tuition will be determined, not the last date of attendance by the student. Written notification of withdrawal must be received prior to the first scheduled day of classes to qualify for a full tuition refund less a $50.00 registration cancellation fee. Written notification of withdrawal received on or after the first scheduled day of classes will result in a refund of tuition according to the following schedule:

Prior to the start of the quarter*	100%
During the first week of the quarter	75%
During the second week of the quarter	50%
During the third week of the quarter	25%

NO FURTHER REFUNDS AFTER THE THIRD WEEK

No refunds will be made because of curtailment of services brought about as a result of strikes, acts of God, civil insurrection, riots or threats thereof, or other causes beyond the control of the University. All fees, charges, and refund schedules in this bulletin are subject to change without prior notice.

REFUND OF ROOM AND BOARD

Students who reside in University residences for less than a full term will be assessed room charges on a prorated basis according to the schedule stipulated in the Student Housing Contract. Students who are evicted from, move from, or otherwise withdraw from University housing during an academic term and who are not released from the contract will continue to be assessed room charges for the remaining portion of that term.

*Less registration cancellation fee

Refund of unused board will be prorated from the Monday following the date of meal ticket cancellation.

Refunds cannot be processed until one month after the student's withdrawal.

FINANCIAL AID

Santa Clara University maintains a broadly based program of financial assistance for its students. Administered by the Financial Aid Office, this resource helps bridge the gap between the cost of education and what parents and students can reasonably contribute.

The financial need of each family is estimated from information supplied on the Financial Aid Form (FAF) or College Scholarship Service (CSS) version of the Student Aid Application for California (SAAC).

On the basis of this estimate, a "package" of financial assistance is prepared for the student, subject to the amount of total aid dollars available and any adjustments made by the aid office. Depending on the student's eligibility, an aid package may include any combination of the following: scholarships, grants, loans, or part-time on-campus employment.

Financial help from the University and other sources should be viewed as supplementary to the efforts of the student and family. Santa Clara University believes that the maximum effort to assist students with college expenses rests with the family. Working together, families and the University can ensure that although the cost of a college education is high, it need not be prohibitive.

More complete information about the University's financial aid program is available in the Student Financial Services bulletin *Putting It Together.* Specific questions concerning information in the bulletin, or the limited grant program for disadvantaged students, should be addressed to the Financial Aid Office (408-554-4505).

Third-Child Family Grant

The University offers a special tuition remission to families who have three dependent undergraduate students concurrently enrolled at Santa Clara. The program's conditions are

1. All three students must be concurrently enrolled as undergraduates;
2. All three students must be dependent on parents;
3. Parents must apply for the program by submitting a letter requesting the Third-Child Family Grant and a copy of their latest federal income tax return showing all three students as dependents;
4. All financial aid deadlines should be followed in making application.

Applying for Financial Aid

Aid packages including any combination of scholarships, grants, loans, and on-campus employment may vary in dollar amount each year depending on the student's family financial circumstances. Packages are renewable annually

provided the student fulfills the University's requirements and reapplies each year by the application priority deadlines indicated below. New undergraduate applicants with completed documents on file by February 1 preceding September enrollment should be notified of their aid eligibility no later than June 1. Undergraduate renewal applicants must reapply by May 1 each year and will receive notification of their aid eligibility prior to fall registration.

To apply for financial aid consideration a student must submit the following documents by the indicated dates:

1. **Submit required documents—all students**

   Financial Aid Form (FAF) or College Scholarship Service (CSS) version of the Student Aid Application for California (SAAC) ..... **February 1**

2. **Submit supplementary documents (where applicable)**

   a. Financial aid transcripts—transfer students ..... **May 1**
   b. Immigration and Naturalization Service (INS) status document—eligible noncitizens ..... **May 1**
   c. Student's U.S. tax returns, if requested ..... **May 1**
   d. Parents' U.S. tax returns, if requested ..... **May 1**
   e. Verification documents, if requested ..... **May 1**

Aid Qualifications

The selection of students to receive financial aid requires evidence of financial need. Once this criterion has been met, priority of consideration is given to applicants with the highest scholastic attainments. Students of exceptional academic merit should write to the director of the Honors Program.

Scholarship recipients are expected to maintain an overall grade point average of 3.0. All other aid recipients must maintain a GPA of 2.0. All financial aid recipients must remain enrolled as full-time students (minimum of 12 quarter units) for each quarter in which aid is received and must make satisfactory progress toward a degree. Please refer to the Academic Standing section of this bulletin (pages 244–246) for specific criteria on good standing and the Student Classification section (page 228) for specific criteria on normal progress. Financial aid may be terminated at any time for serious infractions of the University's rules and regulations. As a general rule, graduate and professional students will receive consideration for financial aid after the undergraduate needs have been met. Ordinarily, financial aid is not available for noncitizens unless they are in the United States on a permanent basis and have made application for citizenship. It is the financial aid recipient's responsibility to notify the Financial Aid Office immediately of any changes in address, name, marital status, academic status, or family financial situation.

Eligibility for financial aid is for a maximum of 12 quarters. Request for an extension of this maximum must be addressed in writing to the Financial Aid Office.

All financial aid awarded will be distributed in equal installments to coincide with the number of academic periods in the year and will be placed as a credit on the student's account at the Student Accounts Office.

Loans

Because scholarships and grants are limited, many students applying for aid find it most advantageous to finance a portion of their education through a loan program. Among programs available to students are the Perkins Loans (formerly National Direct Student Loans), Stafford Loans (formerly Guaranteed Student Loans), Supplemental Loans for Students, Parent Loans for Undergraduate Students (PLUS), and Family Ed Loans. Further information may be obtained by consulting the Student Financial Services bulletin *Putting It Together.*

Employment

The University maintains a Placement Center on campus to assist students in securing part-time work. Students who receive financial aid are expected to contribute as much as possible from their own resources to assist in meeting their costs at Santa Clara.

Tentative Financial Aid Deadlines for 1989–90 and 1990–91

Please consult the 1989–90 edition of *Putting It Together,* available from the Financial Aid Office.

	1989–90	1990–91
Winter quarter	December 1, 1989	December 1, 1990
New scholarship and grant consideration	February 1, 1989	February 1, 1990
Perkins Loan and Work-Study (nonrecipients)	February 1, 1989	February 1, 1990
Spring quarter	March 1, 1989	March 1, 1990
Cal Grants	March 2, 1989	March 2, 1990
Financial aid renewal	May 1, 1989	May 1, 1990
Pell Grants (apply as early as possible)	May 15, 1990	May 15, 1991

These deadlines are tentative and should be confirmed with the Financial Aid Office after October 1989.

Note: All Stafford Loan applications must be completed and in the Financial Aid Office not later than six weeks prior to a registration period. Applications received later than this date will be processed as time allows, normally after registration. Information on summer session aid will be available from the Financial Aid Office *after* June 15.

4

University Curriculum

Santa Clara's education of "the whole person" requires a program of study that reflects breadth as well as depth, imparts a common body of knowledge to all students, develops the capacity for critical judgment and clear expression, and encourages a desire for lifelong learning.

The University Curriculum, approved by the Board of Trustees in 1981, establishes course requirements to meet seven educational goals:

1. An ability to write clearly and effectively and to read critically (Composition and Literature);
2. An understanding of the history of Western culture and the methods of inquiry characteristic of the humanities (Western Culture);
3. An understanding of another culture through the study of a foreign language (Foreign Language);
4. An understanding of human behavior and the methods of inquiry characteristic of the social sciences (Social Sciences);
5. An understanding of the natural world and the methods of inquiry characteristic of mathematics and the natural sciences (Mathematics and Natural Sciences);
6. An ability to make decisions based on ethical principles (Ethics);
7. An understanding of the religious dimensions of life (Religious Studies).

5

College of Arts and Sciences

The College of Arts and Sciences, comprising the traditional liberal arts disciplines, offers courses in the humanities, arts, social sciences, and natural sciences. The College provides

- major programs of study for in-depth education in a variety of traditional academic disciplines;
- the University Curriculum common to the education of all undergraduate students at Santa Clara;
- courses beyond the departmental major programs for further understanding in areas of particular interest to students.

The College confers the Bachelor of Arts degree in Art, Classics, Communication, Dance, English, French, German, History, Italian, Multidisciplinary Studies, Music, Philosophy, Religious Studies, Spanish, and Theatre Arts.

It confers the Bachelor of Science degree in Anthropology, Biology, Chemistry, Combined Sciences, Computer Science (Mathematics), Economics, Engineering Physics, Mathematics, Multidisciplinary Studies, Physics, Political Science, Psychology, and Sociology.

Special programs in Multidisciplinary Studies and Combined Sciences provide students the opportunity of studying issues from the perspective of more than one academic discipline. In addition, the Department of Music offers a Bachelor of Music in Performance.

BACHELOR OF ARTS

The program of study for the degree of Bachelor of Arts, which consists of a total of 175 quarter units, includes courses that fulfill the goals of the University Curriculum, the College of Arts and Sciences curriculum, and the respective departmental major curriculum.

For the Bachelor of Arts degree, students must fulfill the following University and College requirements:

Composition and Literature

Three courses: (a) two courses in composition and rhetoric, normally, English 1 and 2; and (b) one course in writing or in literature that includes a writing component. This course should preferably be taken after completing 60 quarter units.

Western Culture

Three courses outside the major department, in one of the following sequences: (a) English 11, 12, and 13; or (b) History 11, 12, and 13; or (c) Philosophy 11, 12, and 13; or (d) Art History 11, 12, and 13. The three courses in Western Culture should normally be taken in sequence.

Foreign Language

Successful completion of the third course of the first-year sequence in a single classical or modern foreign language. Students who have successfully completed four years of study in a single classical or modern foreign language during high school or who demonstrate an equivalent level of proficiency by passing a language proficiency examination are exempt from this requirement.

Social Sciences

One course from the following: Anthropology 1, 2, 3; Economics 1, 2; Political Science 1, 2, 25, 40; Psychology 10, 11, 70; Sociology 1, 25, 33.

Mathematics and Natural Sciences

Three courses: (a) one course in mathematics equivalent to, at least, college algebra; (b) one course in natural science; and (c) one additional course in either mathematics or natural science.

Ethics

One course in general or applied ethics from the ethics offerings in the Department of Philosophy.

Religious Studies

Three Religious Studies courses: (a) two courses, normally taken during the freshman and sophomore years—one Introductory-Level Religious Studies course and one Intermediate-Level Religious Studies course; and (b) one Advanced-Level Religious Studies course taken after completing 88 quarter units. These courses are to be taken in sequence.

Fine Arts

One course in studio art or performance.

Ethnic Studies and Women's Studies

One course in Ethnic Studies or Women's Studies.

Students must also fulfill the course requirement for the departmental major. For these requirements, consult the departmental description for the respective major: Art, Classics, Communication, Dance, English, History, Modern Languages, Multidisciplinary Studies, Music, Philosophy, Religious Studies, and Theatre.

Depending on the departmental major requirements, students will have a number of elective courses.

BACHELOR OF SCIENCE

The program of study for the degree of Bachelor of Science, which consists of a total of 175 quarter units (193 quarter units for Engineering Physics), includes courses that fulfill the goals of the University Curriculum, the College of Arts and Sciences curriculum, and the respective departmental major curriculum.

For the Bachelor of Science degree, students must fulfill the following University and College requirements:

Composition and Literature

Three courses: (a) two courses in composition and rhetoric, normally English 1 and 2; and (b) one course in writing or in literature that includes a writing component. This course should preferably be taken after completing 60 quarter units.

Western Culture

Two courses in one of the following sequences: (a) English 11, 12, and 13; or (b) History 11, 12, and 13; or (c) Philosophy 11, 12, and 13; or (d) Art History 11, 12, and 13. The two courses in Western Culture should normally be taken in sequence.

Foreign Language

Majors in Social Sciences Successful completion of the third course of the first-year sequence in a single classical or modern foreign language. Students who have successfully completed four years of study in a single classical or modern foreign language during high school or who demonstrate an equivalent level of proficiency by passing a language proficiency examination are exempt from this requirement.

Majors in Mathematics and Natural Sciences Successful completion of the second course of the first-year sequence in a single classical or modern foreign language. Students who have successfully completed three years of study in a single classical or modern foreign language during high school or who demonstrate an equivalent level of proficiency by passing a language proficiency examination are exempt from this requirement.

Social Sciences

One course *outside the major* from the following: Anthropology 1, 2, 3; Economics 1, 2; Political Science 1, 2, 25, 40; Psychology 10, 11, 70; Sociology 1, 25, 33.

Mathematics and Natural Sciences

Four courses: (a) a minimum of two courses in mathematics and (b) a minimum of two courses in natural sciences.

Ethics

One course in general or applied ethics from the ethics offerings in the Department of Philosophy.

Religious Studies

Three Religious Studies courses: (a) two courses, normally taken during the freshman and sophomore years—one Introductory-Level Religious Studies course and one Intermediate-Level Religious Studies course; and (b) one Advanced-Level Religious Studies course taken after completing 88 quarter units. These courses are to be taken in sequence.

Ethnic Studies and Women's Studies

One Ethnic Studies or Women's Studies course.

Students must also fulfill the course requirements for the departmental major. For these requirements, consult the departmental description for the respective major: Anthropology, Biology, Chemistry, Combined Sciences, Computer Science (Mathematics), Economics, Engineering Physics, Mathematics, Multidisciplinary Studies, Physics, Political Science, Psychology, and Sociology.

Depending on the departmental major requirements, students will have a number of elective courses.

COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF ANTHROPOLOGY AND SOCIOLOGY

Professor: Witold Krassowski *(Acting Chair)*
Associate Professors: Alma Garcia, Paul F. Verden, George D. Westermark
Assistant Professors: Mary Elaine Hegland, Kichiro K. Iwamoto, Charles H. Powers

The Anthropology and Sociology Department offers two distinct degree programs leading to the Bachelor of Science in Anthropology or the Bachelor of Science in Sociology. Course offerings in anthropology cover the four major

areas of the discipline: cultural anthropology, linguistics, physical anthropology, and archaeology. Courses in sociology are organized into three main components: introductory, social inquiry, and core and elective courses. A special emphasis in gerontology is available to interested majors. A minor in anthropology or sociology is also available.

A solid undergraduate foundation in anthropology or sociology secures the analytical skills needed to undertake professional degree programs (in anthropology, sociology, law, and social services) or to embark on a number of careers (from banking to management to research).

REQUIREMENTS FOR THE ANTHROPOLOGY MAJOR

Anthropology majors must fulfill the general requirements of the University for the Bachelor of Science degree (see pages 33–34). In addition, they must complete the following requirements:

1. Mathematics 8 (Introduction to Statistics)
2. Anthropology 1 (Introduction to Physical Anthropology), 2 (Archeology and Prehistory), 3 (Introduction to Social and Cultural Anthropology)
3. Sociology 1 (Principles of Sociology)
4. Anthropology 116 (Anthropological Methods), 121 (Contemporary Social Theory), and 124 (Senior Thesis)
5. Five upper-division courses in anthropology, at least one of which must be a culture area course

REQUIREMENTS FOR THE SOCIOLOGY MAJOR

Sociology majors must fulfill the general requirements of the University for the Bachelor of Science degree. In addition, they must complete the following:

1. Mathematics 8 (Introduction to Statistics)
2. Sociology 1 (Principles of Sociology) and either 25 (Introduction to Social Psychology) *or* 33 (Social Problems in America)
3. Anthropology 3 (Introduction to Social and Cultural Anthropology)
4. Sociology 116 (Methods of Social Research), 121 (Contemporary Social Theory), and 124 (Senior Thesis)
5. Five upper-division courses in sociology. Three of these must be from the following list of core courses: 125 (Social Psychology), 132 (Social Stratification), 137 (Social Change), 138 (Demography), 148 (Complex Organizations), 157 (Family and Kinship), 162 (Political Sociology)
6. The other two may be selected from any other upper-division course offerings in sociology.

An average grade of C must be maintained in courses in the major. By the end of the fall quarter of their senior year, majors in both anthropology and sociology must complete a senior thesis approved by the faculty of the department. Majors must have completed the lower-division requirements prior to undertaking the senior thesis.

SPECIAL PROGRAMS

Gerontology

Majors in anthropology and sociology may concentrate in gerontology, which examines the adaptation of the elderly to their living environments, to their self-image, and to public attitudes and policies toward them.

In addition to the Bachelor of Science and departmental requirements, the following courses are required for the concentration in gerontology:

1. Biology 190 (Contemporary Issues in Biology)
2. Sociology 198 (Practicum in Aging)
3. Three upper-division courses selected from the following: Anthropology 172 (Anthropology of Aging), Psychology 188 (Adult Development Seminar) or 196 (Psychology of Aging), Sociology 172 (Sociology of Aging), Sociology 176 (Law and the Elderly), and Political Science 168 (Public Policy: Aging)

Also possible are less structured concentrations emphasizing communications, law and government, primary and secondary education, or public service and administration. Interested students should consult with their departmental academic advisers.

ANTHROPOLOGY

1. Introduction to Physical Anthropology

Study of the origin and antiquity of man, the fossil evidence for human evolution, primate behavior, and human variation in morphology, serology, and genetics.

2. Archaeology and Prehistory

Survey of the evolution of human culture during the prehistoric period in both the Old World and the New World and an examination of the methods archaeologists use to study the past.

3. Introduction to Social and Cultural Anthropology

Concept of culture, the development and evolution of social and cultural analyses of the major subsystems of culture (economic, ethnological, social, and political organizations, philosophy, and worldview), and selected issues of social concern; racism, cultural determinism, cultural relativity.

3.77. Introduction to Social and Cultural Anthropology

Honors. NCX†

4. Vanished People and Lost Civilizations

Examination of "popular anthropology." Humans and their culture, human origins, and the development and understanding of human behavior. Evaluation of theories and assumptions in the popular literature in light of current anthropological knowledge.

40. Climate and Culture Through the Ages

Examination of the nature of climate, its impact on culture, and the methods used to study both climate and culture through time. Discussion of topics such as the

†Exempted from challenge

Viking expansion, the fall of the Roman Empire, the greenhouse effect, and the ozone hole.

51. Religion, Ritual, and Politics

Examination through case studies of the uses of religion and ritual in politics: in legitimizing the status quo, in political competition, and in organizing passive and active political resistance. How and why religion and ritual are used in political activity such as black history, the revolution in Iran, sexual politics, communist and Catholic parties in Italy. Possible reasons behind the current religious resurgence in the United States and elsewhere.

56. Anthropology of Religion

Relation of religion to culture, personality, and social organization. Theories on the functioning of myth, ritual, and symbolism. Religious leaders, interpretations of death and afterlife, traditional curing, and religious movements and cults.

86. Native American Cultures§

Study of the range of variation in native American cultures. Examination of changes in recent history as well as contemporary issues.

88. Women in the Middle East‡

Examination through monographs, novels, and films of the situation and activities of Middle Eastern women in a variety of geographical and class settings. Women in economic and political process, family and kinship, wars of liberation and revolution. Women and gender symbolism as related to politics, development, social change, and religious resurgence.

90. Cross-cultural Study of Women‡

Cross-cultural examination of the roles and statuses of women and men. Exploration of a variety of factors affecting the lives of women and men, such as public and domestic realms of activities, political and economic factors, and family and socialization practices. Comparisons of the situation of women and men in the United States to determine the origins and future of sex roles in our own society.

91.01 to 91.99. Lower-Division Seminar in Anthropology

Seminar for freshmen and sophomores on selected issues in anthropology. By permission of the instructor only. NCX†

116. Anthropological Methods

Logic of research procedures and the theoretical and practical issues arising from anthropological research. Skills and methods of designing and analyzing research explored in readings and exercises. Design of an original research proposal. Required for juniors majoring in anthropology. *Prerequisites: Math 8, Anthropology 3 and 121, or permission of the instructor.* NCX†

118. Classical Social Theory

Analysis of the works of major theorists who have influenced sociology and anthropology. Emphasis on Marx, Durkheim, Weber: the content and historical context of their approaches and the value and problems of their legacy.

121. Contemporary Social Theory

In-depth treatment of recent innovations and developments in social thought. Emphasis on explaining what is essential about particular theoretical frameworks, how they can be used, and why they should be given attention.

124. Senior Thesis

Senior majors complete their theses under the guidance of faculty advisers and make seminar presentations of their work. NCX†

†Exempted from challenge §Course included in Ethnic Studies program
‡Course included in Women's Studies program

130. Primatology

Survey of the social behavior and organizations of monkeys and apes as known from laboratory and field studies. Examination of their relevance to the evolution of human behavior and social groups.

135. Human Diversity

General survey of the techniques and problems of racial classification. Emphasis on the genetic approach (both molecular and populational). Theories of racial origins and the selective bases of human variation.

144. Cultural Ecology

Survey of the theories, methods, and applications of the ecological perspective to the cultural attributes of past and present human populations. Emphasis on the relationship between the natural environment and human cultural systems.

149. North American Prehistory

Survey of the prehistoric cultures of North America and Northern Mexico from earliest human occupation to European colonization.

150. Religion in Culture and Society

Cross-cultural examination of religions in a range of human societies. Emphasis on religious pluralism, religious movements, and secularism in the contemporary world.

151. Law and Conflict Resolution

Current issues in the anthropology of law and conflict resolution. Exploration of legal systems at various levels of societal complexity to understand the basis for social control in all human societies. Courts, legal professions, and politics from a cross-cultural perspective.

152. Political Anthropology

Cross-cultural examination of political behavior in a range of human societies and the effects of social, cultural, and environmental factors on political organization. Religion and politics, the role of women in politics, ethnic competition, secret societies, political ritual and ceremony, and the effects of colonialism and economic change. Special attention given to the relationship between local communities and national governments.

154. Islam in the Middle East

Examination of the variety of religious experiences, activities, and interpretations among Muslims and of the place of Islam in current social and political life such as community organization, local-level politics, governments and political resistance, women's roles, and contact with the West. Discussion of the underlying reasons behind the recent resurgence of Islam and its effects on Muslim societies.

155. Psychological Anthropology

Exploration of how group differences in behavior come about and how such differences are related to other aspects of culture and social life. The basic, underlying similarities among human beings, which set limits to the range of differences and variations that can be observed in human behavior. Cross-cultural study of cognition and perception, child rearing, mental health, and cultural change. *Prerequisites: one course in anthropology and one course in psychology.*

156. Sociolinguistics

Language as context, referent, and dimension of social behavior. Interdisciplinary examination of language in society: ethnography of speaking, cognition, bilingualism, social dialects, language change, and language planning.

157. Family and Kinship‡

Ways in which kinship and family life can be organized. Causes and consequences of different family patterns. How families differ across cultures, over time,

‡Course included in Women's Studies program

and among different groups in the United States.

158. Applied Anthropology

Application of anthropological knowledge to contemporary human problems. Topics range from the introduction of new crops in agricultural development to miscommunication in international business. Concerns of education, health, and volunteer services. Implications of ethical problems and theories of social change.

160. Urban Life

Cross-cultural examination of life in urban environments. Emphasis on how the city shapes various social institutions from the family to religious associations. Transition from rural to urban life in relation to such factors as economic change, migration, and ethnic affiliation.

172. Anthropology of Aging

Cross-cultural examination of the aging process in a range of human societies. Emphasis on level of technology, degree of urbanization, rate of social change as well as social, political, and cultural differences in understanding how old people adapt to, and cope with, the modern world.

181. Pacific Island Societies

Examination of the societies of the three culture areas of the Pacific: Melanesia, Micronesia, and Polynesia. Comparison of traditional ecological adaptations, social organization, and belief systems. Colonialism, economic change, migration, and political independence.

187. Peoples and Cultures of the West Coast§

Distinctive native American cultures found along the West Coast of North America from California to Alaska, their complex social organizations, sophisticated art, and elaborate rituals and ceremonies such as the potlatch. Use of archaeological, ethnographic, and historic information to compare/contrast economies, social organization, and belief systems in the past and in transition to the present.

188. People, Culture, and Change in the Middle East

Examination of people's lives, social organization, and change in the Middle East through ethnographies, film, and novels. Emphasis on political culture, the fate of tribal peoples and peasants under modernizing nations, women in society and gender symbolism, contact with the West, Islam and religious resurgence, and revolution.

193.01 to 193.99. Advanced Seminar in Anthropology

Seminars for juniors and seniors on selected topics in anthropology. By permission of the instructor only. NCX†

196. Archaeological Method and Theory

Introduction to the techniques of discovery and analysis that archaeologists have found useful in research. Special attention to sampling techniques in survey and excavation. Classification techniques for measuring parameters of prehistoric demography, diet, craft specialization, and exchange.

197.1, 197.2. Field Course in Archaeological Method

Six weeks of on-site archaeological field research. Practical experience in the basic techniques of excavation and field analyses. By permission of the instructor only. NCX†

198.1, 198.2, 198.3. Practica

Opportunity for students in good standing to work and conduct anthropological analyses in community agencies, government bureaus, and political or industrial organizations. May be taken on a part-time basis as a one- or two-term equivalent or on a full-time basis as a

†Exempted from challenge §Course included in Ethnic Studies program

three-term course. Written application for this course must receive departmental approval prior to registration. NCX†

199.1, 199.2, 199.3. Directed Reading/Directed Research

Intensive reading in areas not emphasized by the department. Independent research on specific topics not fully covered in departmental courses. Written application for this course must receive approval from the department and the Office of the Dean prior to registration. NCX†

SOCIOLOGY

Introductory Courses

1. Principles of Sociology

Introduction to the field of sociology. Emphasis on the major sociological perspectives and the basic elements of sociological analysis. Introductory exposure to research methodology.

1.77. Honors Seminar in Principles of Sociology

Restricted to students in the University Honors Program. Major issues in sociology. NCX†

25. Introduction to Social Psychology

Examination of such topics as the nature and boundaries of the self, self/other relations and groupings, interpersonal communication, and power and influence relations.

33. Social Problems in America

Contemporary social problems and issues in American society from a sociological perspective. Focus on the changing family, gender roles, poverty, racism, crime and violence, and international conflict.

48. Bureaucracy and Society

Introduction to bureaucratic structures in American society. Examination of various types of formal organizations such as industrial organizations, prisons, mental hospitals, and the federal government and their social consequences.

51. Gender Roles and Work

Examination of the status and roles of men and women in the labor force. How gender differences are developed through socialization and some of the consequences of these differences: tokenism, sexual harassment, the "glass ceiling," and the dual-career family. Also examines strategies and policy remedies for gender inequality in the workplace.

65. Crime and Delinquency

Broad survey of major issues surrounding the causes and nature of, and solutions to, the problem of crime and delinquency in the United States.

69. Popular Culture

Sociohistorical analysis of shifting currents and significant trends in the development of popular mass culture activities in the United States since 1900. Emphasis on the continued presence of folk and ethnic art forms (including music, dance, and humor) and the emergence of a mass entertainment industry.

91.01 to 91.99. Lower-Division Seminar in Sociology

Seminar for freshmen and sophomores on selected issues in sociology. By permission of the instructor only. NCX†

†Exempted from challenge

Inquiry Courses

99. Introduction to Computers and Social Research

Introduction to the process of computer analysis of social science data. Coding, inputing, and statistical analysis of survey data by means of the SPSS computer software package. Intended to complement, but not replace, basic statistics courses.

116. Methods of Social Research

Introduction to the logic and strategies of social research. Field studies, archival research, comparative analysis, and experimental design. Students examine and critique examples of each type of research from the social science literature and design a research project of their own. *Prerequisites: Math 8 and Sociology 1 or permission of the instructor.* NCX†

117. Introduction to Survey Research

Formulation, design, and analysis of survey research. Analysis of quantitative data using SPSS, a computer software system. *Prerequisites: Math 8 and Sociology 116.* NCX†

118. Classical Social Theory

Analysis of the works of major social thinkers. Emphasis on the work of Comte, Marx, Dilthey, Simmel, Durkheim, Freud, and Weber. Recommended for students planning graduate studies.

121. Contemporary Social Theory

In-depth treatment of recent innovations and developments in social thought. Emphasis on explaining what is essential about particular theoretical frameworks, how they can be used, and why they should be given attention. Consideration given to several of the "new sociologies"—critical theory, phenomenology, existential sociology, hermeneutics, Western Marxism, semiotics.

124. Senior Thesis

Senior majors complete their theses under the guidance of faculty advisers and make seminar presentations of their work. NCX†

Core and Elective Courses

125. Social Psychology

Individuals in social contexts. Perception, social influence, persuasion, interpersonal attraction, power, status and norm formation, and conformity. Credit cannot be given if Psychology 150 has been taken. (Core course)

127. Small Groups

Structure and social processes that occur in small groups. Power and prestige, leadership, communication networks, game theory, and distributive justice.

129. The Process of Communication

Communication is a sociopsychological and cultural process. Examination of the nature, elements, and patterns of the communication process at the individual, interpersonal, small-group, and organizational levels.

132. Social Stratification§

Analysis of the principal lines of social cleavage within American society. Emphasis on the racial, sexual, ethnic, occupational, and class divisions prevalent in the contemporary world. Affirmative action and reverse discrimination, IQ and race, exploitation, elites and ruling classes, under- and unemployment, poverty, the position of blue-collar and white-collar workers, the position of women in the labor force, and housework. (Core course)

†Exempted from challenge §Course included in Women's Studies program

133. Politics and Society in Third World Countries

Social and political change in the Third World. Relationship between economic and social development and the emergence of democratic, authoritarian, or revolutionary regimes in Africa, Asia, and Latin America. Emphasis on ways in which the international system influences development through investigation of theories of interdependence, dependency, and neo-imperialism.

135. Women and Social Change in Latin America‡

Examination of the effects of social change and development policies on Latin American women. Emphasis on specific Latin American societies and forms of governments including peasant societies and capitalist, socialist, and revolutionary regimes.

136. Deviant Behavior

Examination of such deviant behavior as crime, mental disorder, and alcoholism. Social factors in the etiology and control of deviant behavior.

137. Social Change

Significant trends and issues in contemporary American society and in the world. Utility of sociological concepts and principles in understanding contemporary society. (Core course)

138. Demography

Demographic issues in the modern world. Introduction to the study of population. Population measures, patterns of growth, and problems of quantity, quality, composition, distribution, and migration. Population policies: population, environment, natural resources, and the quality of life. (Core course)

148. Complex Organizations

Examination of bureaucracy. Structural characteristics and consequences of living in a bureaucratic society. Examples drawn from industrial organizations, mental institutions, prisons, and universities. (Core course)

153. Minority Women in the United States§‡

Examination of the economic, social, political, and cultural experiences of minority women (Chicanas, Blacks, Asian Americans, and American Indians) in the United States.

157. Family and Kinship‡

Marriage, the family, and kinship in U.S. society and cross-cultural perspective. (Core course)

159. Peoples and Cultures of Eastern Europe

Examination of the historical, political, and socioeconomic dimensions of the people and cultures of Eastern Europe. Discussion of contemporary issues, changes in social structure and behavioral patterns, and likely future changes in these areas. Primary emphasis on Czechoslovakia, Hungary, and Poland, with Bulgaria, Romania, and Yugoslavia receiving secondary consideration.

162. Political Sociology

Phenomena of political power, organization, and authority as the most crucial aspects of social life and human existence. Problems of legitimation of political systems, political ideologies, participation in the political sphere, the role of elites, state involvement in the economy, and the politics of social change in advanced industrial societies. (Core course)

163. Industrial Sociology

Ideological and institutional characteristics of modern industrial society and some of its basic problems, such as alienation, affluence and work motivation models, primary group influences, and leadership behavior.

§Course included in Ethnic Studies program ‡Course included in Women's Studies program

164. Collective Behavior

Analytical study of collective behavior principles; typology of crowds, mass behavior, and the characteristics of publics. Introduction to social movements.

166. Sociology of Crime

Relationship between crime and society. Discussion of theories of criminal behavior, white-collar crime, juvenile crime, women and crime, prisons, the death penalty, and the philosophy of punishment.

172. Sociology of Aging

Introduction to social gerontology. Theoretical approaches and research in social gerontology; the elderly—public attitudes, self-image, social bonds, living environments, public policies, programs, and major problem areas; death and dying.

173. Work and Leisure

Past, present, and future work and leisure in human culture. The apparent complementary nature of work and leisure examined in terms of cultural context, selected social institutions, systems of stratification, technology, social role, and self-concepts. A consideration of the changing meaning of such terms as time, wealth, alienation, and sloth.

176. Law and the Elderly

A survey of public policy issues particularly affecting the elderly. Subjects considered are the legal aspects of death and dying, involuntary commitment, guardianship and conservatorship, age discrimination, public benefit programs, and nursing homes. Also offered by the School of Law (course 465). Open to juniors and seniors.

177. Intercultural and International Communication

Communication in the "global village." Examines the nature, characteristics, and structures of intercultural transactions using the sociopsychological and anthropological approaches; provides a framework for analysis of the theoretical and applied aspects of international communication with emphasis on the formal interactions between nations and their governments in the forms of diplomacy and propaganda.

179. Mass Communication and Mass Media

Sociopsychological and cross-cultural examination of the nature and characteristics of mass communication and its impact on the individual and society. Mass media: their functions and dysfunctions, structure, controls, and ethical issues.

193.01 to 193.99. Advanced Seminars in Sociology

Seminars for juniors and seniors on selected issues in sociology or current problems of social relevance. NCX†

198.1, 198.2, 198.3. Practica

Opportunity for students in good standing to work and conduct sociological analysis in community agencies, government bureaus, and political or industrial organizations. May be taken on a part-time basis as a one- or two-term equivalent or on a full-time basis as a three-term course. Written application for this course must receive department approval prior to registration. NCX†

199.1, 199.2, 199.3. Directed Reading/Directed Research

Intensive reading in areas not emphasized by the department. Independent research on specific topics not fully covered in departmental courses. Written application for this course must receive approval from the department and the Office of the Dean prior to registration. NCX†

†Exempted from challenge

COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF ART

Associate Professors: Brigid S. Barton *(Chair)*, Robert Kelly Detweiler, Samuel R. Hernandez
Assistant Professors: Eric C. Apfelstadt, Susan J. Felter
Senior Lecturer: Gerald P. Sullivan, S.J.
Bannan Scholar: James R. Blaettler, S.J.

The Art Department offers a major program in the production and history of art as well as elective or required courses for nonmajors. Minors in studio art and in art history are also available.

REQUIREMENTS FOR MAJOR

Art majors may choose an emphasis in studio practice or art history as a preparation for careers in art or graduate studies directed toward teaching or research in art history, museum studies, or commercial or fine arts. In addition to completing the major requirements specified below, art majors must fulfill University and Bachelor of Arts requirements (pages 31–33).

Art majors should select a University Curriculum sequence outside the major from one of the following three areas:

1. English 11, 12, and 13 (Literature I, II, III)
2. History 11, 12, and 13 (Ancient, Medieval, Modern)
3. Philosophy 11, 12, and 13 (Classical & Medieval, Early Modern, Modern & Contemporary)

For those students who have studied abroad, no more than one-half of their art courses (studio art or art history) may be taken at an overseas institution for credit toward the major or minor in art at Santa Clara University. Students who wish to receive credit toward a major or minor in art with courses from other institutions must, in any case, undergo a review by members of the Art Department faculty. Students must be able to document work completed at other institutions, whether in the United States or abroad.

Senior seminars are strongly recommended for majors: 198 (Art History Senior Seminar) for students emphasizing art history and 196 (Art Studio Senior Seminar) for students emphasizing studio art. *However, the seminars do not count toward the six courses required for the major in art history or studio art.*

Proper credentials will admit a student to the art building after closing time and on weekends until 10:00 p.m. A lab fee may be exacted for all studio courses to help defray the cost of materials.

Studio Art Emphasis

The following lower-division courses are required in the freshman and sophomore years:

1. Art 10 (Introduction to Studio Art)
2. One course from Art 15 through 57
3. One course from Art 63 (Basic Ceramics) or 64 (Basic Sculpture)
4. Two courses from Art History 11, 12, and 13 (Western Culture: Art History I, II, and III)

Six upper-division studio courses, one of which must be Art 154 or Art 157, and two upper-division art history courses are also required. Students emphasizing studio art are also required to exhibit their work in the Freightdoor Gallery during spring quarter of their senior year.

Art History Emphasis

The following lower-division courses are required in the freshman and sophomore years:

1. Art 10 (Introduction to Studio Art)
2. One additional studio art course
3. Art History 11, 12, and 13 (Western Culture: Art History I, II, and III)

Six upper-division art history courses and two upper-division studio courses are also required.

STUDIO ART

10. Introduction to Studio Art

Introduction to fundamental principles and techniques of two-and three-dimensional art. Concepts such as color, composition, and light, and the reductive, manipulative, and additive methods of sculpture. Studio course.

15. Basic Photography

Introduction to photography as an art form. Includes basic camera vision and technique, as well as black and white darkroom work. Assignments attempt to stimulate visual awareness and individual creativity. Camera with manual shutter speeds and aperture capabilities required. Studio course.

33. Basic Drawing

Introduction to various drawing media and techniques as well as in the problems of self-expression involved in traditional and contemporary drawing. Studio course.

43. Basic Painting

Introduction to the basic skills and concepts requisite for self-expression in painting media. Emphasis on color and composition. Studio course.

46. Basic Watercolor

Introduction to techniques and materials of watercolor painting. Studio course.

53. Basic Silkscreen

Introduction to the techniques and concepts of silkscreen printing as an art form. Studio course.

54. Basic Lithography

Introduction to the techniques of lithography (printing from stones) as an art form. Studio course.

57. Basic Etching

Introduction to intaglio printing techniques on metal plates through a process of drawing and etching with acids. Studio course.

63. Basic Ceramics

Introduction to three-dimensional problems, materials, and techniques. Hand-building, mold-making, glazing, and firing. Studio course.

64. Basic Sculpture

Introduction to the fundamentals of art in a three-dimensional form, including materials and techniques as well as the problems of expression peculiar to sculpture. Studio course.

97. Special Projects

For lower-division students who want to do an art project not covered in the catalog. Under the direction of a member of the Art Department faculty. Group meetings with the teacher to discuss progress. May be repeated for credit. Open to majors; nonmajors with permission of instructor.

101. Photography

Exploration of concepts in black-and-white photography beyond the basic level. Emphasis on the exploration of individual abilities and expression. Includes collage, hand coloring, artificial lighting, portraiture, and independent projects suitable for each student. Also includes some study/discussion of photography as it relates to contemporary fine art theory and practice. *Prerequisite: some previous experience in black-and-white darkroom work.* May be repeated for credit.

131. Life Drawing

Drawing from life stressing composition, anatomy, and creative drawing. Studio course. *Prerequisite: Art 33 or permission of instructor.* May be repeated for credit.

136. Graphic Design

Exploration of the materials and techniques of graphic design through practical projects including advertisement layout, cover design, trademarks, poster design, and stationery and letterhead design. Analysis of the principles and elements of design and color, line, value, proportion, unity, and composition.

143. Painting

Further study of various styles, techniques, and media in painting. Studio course. *Prerequisite: Art 43 or permission of instructor.* May be repeated for credit.

146. Watercolor

Further study of the techniques, and materials of watercolor painting. Studio course. May be repeated for credit.

153. Silkscreen

Continuation of Art 53. May be repeated for credit.

154. Lithography

Continuation of Art 54. May be repeated for credit.

157. Etching

Continuation of Art 57. May be repeated for credit.

163. Ceramics

Advanced ceramics procedures. Slip casting, throwing on the wheel, combinations of various materials. *Prerequisites: Art 63 or permission of the instructor.* May be repeated for credit.

164. Sculpture

Continuation of Art 64. *Prerequisite: Art 63 or 64 or permission of instructor.* May be repeated for credit.

193. Computer Design Workshop

An interdisciplinary workshop in which engineering, art, and communication students learn to use graphics computers and software. Students work in teams to explore solutions to important social problems, use the computer to illustrate solutions, and complete formal presentations of their findings. Limited enrollment. *Prerequisite: permission of instructor.* (Also listed as Comm 193 and MECH 193.)

194. Computer Art

Using user friendly computers to draw imagery directly and to manipulate photographic imagery. Emphasis on artistic exploration and the development of individual abilities and interests. *Prerequisite: any other studio course in the Art Department.* May be repeated for credit.

196. Art Studio Senior Seminar

Recommended for all senior Studio majors. Course is intended to ensure adequate preparation for graduation and the rigors of graduate school or professional job solicitation. How to prepare a portfolio, the basis for all job and graduate school applications. Resume preparation, artwork preparation for exhibition, and photography of artwork. Students are expected to exhibit their work during the spring quarter in the art gallery. Although highly recommended, this course does not count as one of the six upper-division courses required in studio art for the major.

197. Special Projects

For advanced students who want to do an art project not covered by the courses in the catalog. Under the direction of a member of the Art Department faculty. Group meetings to discuss progress with each other and with the teacher. May be repeated for credit. Open to majors; nonmajors with permission of instructor.

199. Directed Research/Creative Project

Tutorial work in studio art or art history. By permission of the chair of the Art Department, the dean, and the instructor.

ART HISTORY

11. Western Culture: Art History I

Survey of art and architecture of the ancient and medieval worlds. Interdisciplinary emphasis. Major monuments such as the Parthenon and Gothic cathedrals treated in greater depth. With Art History II and III, this lecture course constitutes a University Curriculum sequence, but can be taken separately.

12. Western Culture: Art History II

Survey of the painting, sculpture, and architecture of the period from the Renaissance through the Baroque. Interdisciplinary emphasis. Art of Leonardo da Vinci, Michelangelo, Bernini, Rembrandt, and Rubens studied in greater depth. With Art History I and III, this lecture course constitutes a University Curriculum sequence, but can be taken separately.

13. Western Culture: Art History III

Survey of painting, sculpture, and architecture from the eighteenth century to the present. Interdisciplinary emphasis. With Art History I and II, this lecture course constitutes a University Curriculum sequence, but can be taken separately.

97. Special Projects

For lower-division students who want to do an art project not covered in the catalog. Under the direction of a member of the Art Department faculty. Group meetings with the teacher to discuss progress. May be repeated for credit. Open to majors; nonmajors with permission of instructor.

170. Ancient Art

Analysis of the visual arts and culture of the ancient world. Emphasis on Greek art. Lecture course.

174. Medieval Art

Analysis of various manifestations of the visual arts and culture of the Middle Ages, beginning with the earliest emergence of Early Christian and Byzantine art through the Gothic period. Architecture, sculpture, and painting in the context of the development of European aesthetic consciousness. Lecture course.

175. Early Renaissance Art

Painting, sculpture, and architecture in Italy from the late thirteenth to the late fifteenth century. Emphasis on the foundations and first flowering of the Renaissance style in its cultural context, with particular attention to revolutionary developments in Florence and Siena. Lecture course.

176. High Renaissance and Mannerist Art

Painting, sculpture, and architecture in Italy in the sixteenth century. Emphasis on the mature elaboration and manipulation of the Renaissance style, with particular attention to the cultural contexts of Florence, Rome, and Venice. Lecture course.

177. Northern Art in the Renaissance Period

The visual arts in Northern Europe from the late fourteenth through the sixteenth century, with particular attention to Flanders, Germany, and France. Lecture course.

178. Baroque and Rococo Art

Painting, sculpture, and architecture throughout Europe from the late sixteenth through the early eighteenth century. Particular emphasis on Italy, Spain, Flanders, Holland, and France. Lecture course.

181. American Art

Rise and development of an American expression in the arts. Study of examples of American painting, sculpture, and architecture with a view toward arriving at a broadened understanding of the forces that shaped the specific American point of view in the visual arts. Lecture course.

183. Nineteenth-Century Art: 1780–1880

Neoclassicism, Romanticism, and Realism in the context of nineteenth-century culture in Europe and America. Survey of painting, sculpture, and architecture in this period. Lecture course.

184. Twentieth-Century Art: 1880–1940

Analysis of Post-Impressionism, Cubism, Expressionism, Surrealism, and other important early modernist movements. Painting, sculpture, and architecture relative to major historical trends up to World War II. Lecture course.

185. Contemporary Art: 1940–1980s

Survey of contemporary developments in the arts from the events leading up to Abstract Expressionism to the present, including photography, performance, and the more traditional arts of painting, sculpture, and architecture. Lecture course with field trips.

188. History of Modern Architecture

Survey of Western architecture. Evolution of modern buildings from roots in the nineteenth century to Post-Modernism. In-depth study of major monuments and significant architects. Lecture course.

189. History of Women Artists‡

An attempt to balance the customary approaches in the history of art with an overview of the contributions of women artists to the ongoing historical development of Western visual productions. Lecture course.

190. Museum Studies

Practicum in the varied aspects of museum work. Field trips and guest lecturers from Bay Area museums. By permission of the instructor.

‡Course included in Women's Studies program

197. Special Projects

For advanced students who want to do an art project not covered by the courses in the catalog. Under the direction of a member of the Art Department faculty. Group meetings to discuss progress with each other and with the teacher. May be repeated for credit. Open to majors; nonmajors with permission of instructor.

198. Art History Senior Seminar

Highly recommended for senior art history majors and minors. Presents the origins of the discipline and its current methodologies. Techniques for more effective research, writing, and oral presentation via selected topics. Practical issues involved in the transition from college to art history–related careers. Although highly recommended, this course does not count as one of the six upper-division courses required in art history for the major.

199. Directed Research/Creative Project

Tutorial work in studio art or art history. By permission of the chair of the Art Department, the dean, and the instructor.

COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF BIOLOGY

Professors: Francis R. Flaim, John S. Mooring, Geraldine A. Tomlinson
Associate Professors: Linda D. Caren, William R. Eisinger *(Chair),* Thomas N. Fast
Assistant Professors: Roberta E. Berlani, Janice Edgerly-Rooks, James L. Grainger, David L. Tauck
Scientist-in-Residence: Harold P. Klein

The Department of Biology offers a program leading to the Bachelor of Science degree. Most courses emphasize laboratory work. In addition, the faculty encourages students to assist them in their own research. The major provides students with a broad background in biology that serves as a strong foundation for graduate, medical, or professional studies as well as for careers in teaching, research, or business. The department also offers courses of general interest to all University students who are curious about the nature of living things. A minor in biology is also available.

REQUIREMENTS FOR MAJOR

In addition to completing the University and College requirements for the Bachelor of Science degree (pages 33–34), biology majors must complete the following requirements:

1. Biology 20, 21, 22, 33, and 34; Chemistry 5 (or 7) and 8 (General Chemistry I and II) and 35 and 36 (Organic Chemistry I and II)
2. Physics 106, 107, 108 (General Physics I, II, and III) or Physics 4, 5, and 6 (Physics for Scientists and Engineers I, II, and III)

3. Mathematics 11 and 12 (Calculus and Analytic Geometry I and II) or 6 and 7 (Mathematical Analysis for Social Science I and II)
4. A minimum of seven upper-division biology courses, five of which must include a laboratory (to be selected in consultation with a faculty adviser)
   a. Students must complete at least one upper-division course in each of the following categories: animal, plant, cell, and population biology. A single course may not satisfy the requirements in more than one category.
   b. An overall C average must be maintained in biology courses.

RECOMMENDATIONS FOR MAJOR

1. Chemistry 10 (Quantitative Analysis) and 37 (Organic Chemistry III for Chemists) and Statistics (Biology 160 or Mathematics 8) for students considering graduate and professional schools
2. Spanish for students considering careers in the health sciences
3. Mathematics 11, 12, 13 (Calculus and Analytic Geometry I, II, and III) for students considering graduate and professional schools

SINGLE-SUBJECT CREDENTIAL PROGRAM

Courses offered in the biology curriculum can satisfy the requirements for the Single-Subject Credential Program in Education. The waiver degree program requires the same courses as the major, but with some additional restrictions in subject area and some additional course work. Students are advised to consult with the department chair in their junior year for details of the waiver degree program.

HONORS PROGRAM

Honors students in biology are encouraged to take Biology 198 and/or Biology 199 and honors courses in other departments.

RESEARCH OPPORTUNITIES

Students are encouraged to become involved in original research as part of their undergraduate training. Most faculty involve students in their research; opportunities also exist at neighboring institutions. Course credit can be obtained for research work by enrolling in Biology 198.

LOWER-DIVISION COURSES

4. Cosmic Evolution

Traces the history of life from the "big bang" to the present. Particular attention given to the conditions under which the earliest forms of terrestrial life originated and to their subsequent evolution. General concepts derived from ground-based

experimentation and from space missions. Examination of the prospects for extraterrestrial life. For the nonscience student.

9. Human Biology

An introduction to human physiology and functional anatomy with an emphasis on the brain. Nonmajors only.

20. Structure and Function of Cells and Animals

Introduction to the basic structure and function of animal cells and organ systems. Laboratory 30 hours. *Prerequisite: concurrent enrollment in Chemistry 5 (or 7).*

21. Plant Structure, Function, and Diversity

Introduction to plant anatomy, physiology, development, and diversity. Examination of plant structure-function relationships as well as reproduction and development. Includes an evolutionary survey of Monera, protists, fungi, and plants. Laboratory 30 hours. *Prerequisites: Biology 20 and concurrent enrollment in Chemistry 8.*

22. Cell Biology and Animal Development

Introduction to cell biology, genetics, animal reproduction, and development. Laboratory 30 hours. *Prerequisite: Biology 21.*

33. The Biology of Populations

Survey of the physical and biological factors that determine the distribution and abundance of organisms. Includes evolutionary survey of animals. Laboratory 30 hours. *Prerequisite: Biology 22.*

34. Cell Biochemistry and Physiology

Introduction to the metabolic processes of cells, including the biochemistry of cell components. Topics include anabolism and catabolism of carbohydrates, lipids, proteins, and nucleic acids. Emphasis on cell and organelle structure and function. Laboratory 30 hours. *Prerequisites: Biology 22 and Chemistry 36 (Chemistry may be taken concurrently), or permission of instructor.*

43. Human Ecology

Examination of the relationship between humans and their environment. Resource depletion, energy requirements, pollution, food production, and population problems. Nonmajors only.

75. Human Nutrition

Nature and roles of basic nutrients and vitamins and minerals in maintaining human health. Application of the principles of nutrition to dietary management, vitamin deficiency diseases, and other nutritional topics of current interest. Nonmajors only.

80. Introdution to Marine Science

Biology of the marine environment. Survey of marine organisms and their adaptations to various habitats. Physical and chemical factors in oceanography, marine pollution. Nonmajors only.

82. Human Heredity

Human genetics. Introduction to human reproductive physiology and embryology. Discussion of current techniques in reproductive and genetic manipulation and the social issues that they raise. Nonscience majors only. *Prerequisite: previous biology course (high school or college level) or permission of instructor.* NCX†

85. Microbes and Man

The scientific method, as exemplified by the interaction of microorganisms and humans. Microbial ecology, human diseases, immunity, allergy, microbiology of food, and recombinant DNA research. Nonmajors only.

†Exempted from challenge

99. Special Topics

Investigation of a specific area or topic in the biological sciences. Open to majors and nonmajors.

UPPER-DIVISION COURSES

101. Vertebrate Anatomy

Comparative structure, organization, adaptation, classification. Laboratory 60 hours. *Prerequisite: Biology 20 and 22 or equivalent.*

104. Biology Seminar

Topic will vary depending on which faculty members coordinate the course. Students required to write a paper and present a seminar. *Prerequisite: upper-division standing in biology.* NCX†

107. Histology and Cytology

Cells, basic tissue types, structure, and histogenesis. Basic histological techniques. Laboratory 60 hours. *Prerequisites: Biology 22 and 34 or equivalent.*

108. Hematology

Development, characteristics, regulation, and interactions of components of blood and related tissues. Emphasis on hemoglobinopathies, anemias, leukemias, thrombocytopenias, coagulation, and clotting factor disorders. Laboratory 30 hours. *Prerequisite: Biology 34 or permission of instructor.*

110. Genetics

Basic principles governing inheritance and gene expression in viruses, procaryotes, and eucaryotes. Emphasis on molecular aspects. Laboratory 30 hours. *Prerequisites: Biology 34 and Chemistry 36 or equivalent.*

112. Pathogenic Microbiology

Identification, pathogenesis, epidemiology, prevention, and control of medically important bacteria, rickettsiae, fungi, viruses, and parasites. Host resistance and immunity and assessment techniques for each disease. Laboratory 60 hours. *Prerequisite: Biology 113 or equivalent.*

113. General Microbiology

Characteristics of microorganisms: bacteria, fungi, viruses, rickettsiae. Emphasis on isolation and biochemical identification of bacteria and microbial physiology. Laboratory 60 hours. *Prerequisite: Biology 34 or permission of instructor.*

114. Immunology

Principles, mechanisms, and techniques of humoral and cellular aspects of the immune response. Immediate and delayed hypersensitivity, tissue transplantation, tumor immunology, and immunodeficient states in humans. Laboratory 30 hours. *Prerequisite: Biology 34 or permission of instructor.*

115. Animal Development

Experimental and anatomical analysis of vertebrate development. Emphasis on cellular and molecular mechanisms that control morphogenesis, differentiation, and growth. Laboratory 60 hours. *Prerequisite: Biology 34; Biology 110 is recommended.*

124. Animal Physiology

Course examines the physical and chemical basis of animal life, focusing on the control mechanisms of the major organ systems—neural, endocrine, cardiac, renal, respiratory, and digestive. Laboratory 30 hours. Laboratory work predominately explores aspects of human physiology including several computer-

†Exempted from challenge

assisted studies. *Prerequisites: Biology 34 and Physics 108 (or concurrent enrollment).*

125. Plant Physiology

Physiological processes of plants. Emphasis on current research in the field. Laboratory 30 hours. *Prerequisite: Biology 34.*

128. Plant Development

Study of plant development. Emphasis on the experimental approach and current research. Laboratory 30 hours. *Prerequisite: Biology 34.*

130. Economic Botany

Critical analysis of plant food production potentials with special consideration of modern approaches to pest control and crop improvement including biotechnology. Required field trips. *Prerequisite: Biology 34.* NCX†

132. Field Botany

Field study of vascular plants, especially the seed plants of California; their identification, distribution, and ecology. Laboratory 60 hours. *Prerequisite: Biology 21 or equivalent.*

133. Ecology of California Plant Communities

A study of California plant communities and of the factors that determine their distribution. Laboratory and field work 30 hours. *Prerequisite: Biology 21 or equivalent.*

156. General Ecology

Quantitative study of the interrelationships of organisms with their biotic and abiotic environments. Emphasis on population dynamics, interspecific relationships, community structure, and ecosystem processes. Laboratory and field work 30 hours. *Prerequisites: Biology 33 and Math 7 or 11.*

172. Biochemical Techniques

Laboratory course designed to acquaint those students who have had a lecture course in advanced biochemistry with classic and current biochemical techniques. Laboratory 80 hours. *Prerequisite: Biology 34; Biology 110 is recommended.*

173. Evolution

Basic principles of organic evolution. Emphasis on the modern synthetic theory of evolution. *Prerequisite: Biology 33 or permission of instructor.*

174. Cellular Biochemistry

Study of the function and assembly of cellular organelles and the signal pathways that control cellular proliferation. *Prerequisite: Biology 34.*

175. Molecular Biology

Introduction to the concepts and practical methods used in molecular biology. Lectures focus on critical reading and evaluation of original journal publications. Labs acquaint students with techniques such as Southern blots, cloning and isolation of chimeric plasmid DNA, screening of phage libraries, etc. Independent projects encouraged. Laboratory 60 hours. *Prerequisite: Biology 110 or permission of instructor.*

187. Biology of Aging

Analysis of the human aging process. The biological, medical, social, and ethical issues associated with aging in America. Topics include theories of aging, cancer, osteoporosis, sexuality, health-care costs, and death. *Open to all students. Does not count toward a major or minor in biology.*

190. Contemporary Issues in Biology

Specialized treatment of some aspect of biology of current interest to the biologist as well as to society in general. *Prerequisites will be specified according to topic.* NCX†

†Exempted from challenge

198. Internship and Undergraduate Research

Students wishing to take either of the sections below should have a GPA of 3.0 or better in biology and must present an outline of their projected research to the chair not later than the fifth week of the term preceding the start of the project. (2–5 units)

198.01. Internship

Research in off-campus laboratories under the direct guidance of cooperating research scientists and faculty advisers. Frequent meetings with on-campus advisers.

198.02. Undergraduate Laboratory Research

Supervised laboratory research culminating in a written report suitable for publication. Sustained for one year with credit given for one term. *Prerequisite: departmental and University permission.* NCX†

199. Directed Reading and Research

Detailed investigation of a specific topic in biology under the close direction of a faculty member. *Prerequisite: departmental and University permission.* Students wishing to take this course should have a GPA of 3.0 or better in biology and must present an outline of their projected research to the department chair not later than the fifth week of the term preceding the start of the project, which will continue for one term only. NCX†

†Exempted from challenge

COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF CHEMISTRY

Professor Emeritus: Joseph F. Deck
Professors: Lawrence C. Nathan, William F. Sheehan
Associate Professors: Robert J. Pfeiffer *(Chair),* Lois C. Rosenthal, Michael A. Sweeney, W. Atom Yee
Assistant Professor: Linda S. Brunauer
Lecturer: Steven L. Fedder

The Department of Chemistry offers two baccalaureate degrees. The Bachelor of Science in Chemistry program prepares students for further work in chemistry, either in graduate school or as professional chemists. This program is approved and certified by the American Chemical Society. The Bachelor of Science with a major in chemistry prepares students for a career in medicine, dentistry, law, chemical engineering, business, teaching, or related fields. Each of these specialties requires different supporting courses. Suggested curricula have been prepared by the department. A minor in chemistry is also available.

REQUIREMENTS FOR MAJOR

All students must complete the University and College requirements for the Bachelor of Science (pages 33–34). In addition to these general requirements, the specific departmental programs for each degree are presented below.

Bachelor of Science in Chemistry (Certified)

This four-year curriculum provides graduates with the background necessary to begin a career in chemistry at various industrial and governmental laboratories or to transfer on graduation to institutions offering advanced degrees in chemistry or medicine. The American Chemical Society certifies that this degree meets all its recommended professional standards for chemists.

1. Mathematics 11, 12, and 13 (Calculus and Analytic Geometry I, II, and III); Mathematics 21 (Calculus and Analytic Geometry IV) recommended
2. Physics 4, 5, and 6 (Physics for Scientists and Engineers I, II, and III)
3. One computer course: Chemistry 20, Mathematics 10 (Introduction to Computer Science), or EECS 4 (Introduction to Programming)
4. The language requirement of the College of Arts and Sciences must be satisfied in French or German.
5. Chemistry 5, 8, 9, 10, 35, 36, 37, 101, 111, 112, 130, 141, 151, 152, 153, 156, 181, and 182
6. One additional upper-division course in chemistry, biology, physics, engineering, or mathematics, provided it is acceptable toward its own major

Bachelor of Science with a Major in Chemistry

This four-year program provides a liberal scientific degree suitable for those planning a variety of careers associated with chemistry, including environmental or patent law, business, health-related sciences, and others.

1. Mathematics 11, 12, and 13 (Calculus and Analytical Geometry I, II, and III)
2. Physics 4, 5, and 6 (Physics for Scientists and Engineers), or Physics 106, 107, and 108 (General Physics I, II, and III)
3. One computer course: Chemistry 20, Mathematics 10 (Introduction to Computer Science), or EECS 4 (Introduction to Programming)
4. Chemistry 5, 8, 9, 10, 35, 36, 37, 101, 111, 112, 141, 151, 152, 153, and 181
5. Four additional upper-division biology, physics, chemistry, engineering, or mathematics courses. At least one of these must be chosen from 130, 134, 135, 136, 142, or others that may be offered.

HONORS PROGRAM

Freshmen of superior ability who enroll for either major chemistry degree may apply for admission to the Honors Program.

SINGLE-SUBJECT CREDENTIAL OR WAIVER PROGRAM

The Chemistry Department offers a program that satisfies the requirements of the state of California Single-Subject Credential Program for secondary school teachers. This waiver program is described in more detail on page 207. Students enrolled in the chemistry program follow either the standard or certified degree program in chemistry, but they must also successfully complete Physics 3 and 51. Please consult Dr. Steven L. Fedder of the Chemistry Department at an early date for further details.

Note: Laboratory courses require payment for breakage and chemicals after each course is completed (see page 24). Chemistry 135, 136, 154, 171, and 172 are offered in alternate years.

LOWER-DIVISION COURSES

2. Chemistry and Society

Atomic structure. Acids and bases. Compounds of carbon. Food chemistry. Plastics. Biochemical reactions. Role of chemistry in modern life. Laboratory 3 hrs/wk. For the nonscience student. (4 units) NCX†

4. Water, Water, Water

Scientific measurement. Occurrence of water. Weather. Economics of water. Water as solvent. Physical properties. Chemical reactivity. Purification. Molecular properties. Water in solids. The environment. Laboratory. For the nonscience student. (5 units) NCX†

5. General Chemistry I

Atomic structure. Periodic properties and the periodic table. Nomenclature. Chemical bonding. Molecular structure. Chemical equations and stoichiometric relationships. Properties of gases, liquids, and solids. Equivalent weights. Oxidation and reduction. Chemical properties. Quantitative determinations in the laboratory exercises. Laboratory 3 hrs/wk. *Prerequisites: high school chemistry, physics, algebra, geometry, and trigonometry.* (5 units) NCX†

6. General Chemistry II for Engineers

Same as Chemistry 8. Laboratory. *Prerequisite: Chemistry 5 or equivalent.* (5 units) NCX†

8. General Chemistry II

Solutions. Chemical thermodynamics. Equilibrium. Acids and bases. Ionic equilibria. Electrochemistry. Properties and structures of metals, nonmetals, and their compounds. Laboratory 3 hrs/wk. *Prerequisite: Chemistry 5 or equivalent.* (5 units) NCX†

9. Inorganic Chemistry

Detailed description of the chemical properties of the representative metals, transition metals, nonmetals, and noble gases. Crystal structure. Introduction to the chemical literature. Laboratory 3 hrs/

†Exempted from challenge

wk. *Prerequisite: Chemistry 6 or 8.* (4 units) NCX†

10. Quantitative Analysis

Introduction to the theories and practice of acid-base, oxidation-reduction, complexation, precipitation, potentiometric and spectrophotometric analyses. Laboratory 4 hrs/wk. *Prerequisite: Chemistry 6 or 8.* (4 units) NCX†

20. Computer Applications in Chemistry

Introduction to programming in BASIC and/or FORTRAN. Chemical applications: unit conversions, spectroscopy, colligative properties, gas laws, equilibria, titration curves, thermodynamic and kinetic parameters, and numerical and statistical methods. Use of computer. *Prerequisites: Chemistry 10 and 36.* (4 units) NCX†

30. Survey of Organic Chemistry

Survey of the more important classes of organic compounds. Emphasis on materials of interest to the students of the biological sciences. Laboratory 3 hrs/wk. Intended for students not majoring in chemistry and not planning to take additional courses in organic chemistry. *Prerequisite: Chemistry 1, 2, or 5.* (5 units)

35. Organic Chemistry I

Basic concepts of bonding and structure in organic compounds, stereochemistry. Nomenclature. Physical and chemical properties of alkanes, alkenes, alkynes, and alkyl halides. Introduction to reaction mechanisms. Laboratory 3 hrs/wk. *Prerequisite: Chemistry 6 or 8.* (5 units)

36. Organic Chemistry II

Details of nucleophilic substitution and elimination reactions. Spectroscopic methods of structure determination. Nature and reactions of aromatic compounds and other conjugated pi systems. Conformations and reactions of cycloalkanes. Chemistry of ethers, epoxides, and alcohols. Laboratory 3 hrs/wk. *Prerequisite: Chemistry 35.* (5 units)

37. Organic Chemistry III for Chemists

Aldehyde, ketone, amine, phenol, and carboxylic acid chemistry. Carbonyl condensation reactions. Carbohydrate, protein, and synthetic polymer chemistry. Special topics. Laboratory 3 hrs/wk. *Prerequisite: Chemistry 36.* (4 units)

UPPER-DIVISION COURSES

101. Advanced Inorganic Chemistry

Aspects of atomic structure. Theories of chemical bonding and molecular geometry. Applications of symmetry and group theory. Coordination chemistry. Introduction to organometallic chemistry. Inorganic reactions and mechanisms. Laboratory 3 hrs/wk. *Prerequisites: Chemistry 10, 36, and Physical Chemistry.* (5 units) NCX†

111. Instrumental Methods of Analysis I

Principles and use of instruments. Ultraviolet, visible, infrared, Raman, nuclear magnetic resonance, and atomic absorption spectroscopy. X-ray diffraction. Laboratory 3 hrs/wk. *Prerequisites: Chemistry 10, 37, 101, and 153.* (5 units) NCX†

112. Instrumental Methods of Analysis II

Selected electrochemical and thermo-analytical methods. Gas chromatography. High-performance liquid chromatography. Mass spectrometry. Laboratory 3 hrs/wk. *Prerequisite: Chemistry 111.* (5 units) NCX†

†Exempted from challenge

130. Organic Syntheses

Syntheses of selected organic compounds by advanced methods demonstrating oxidation/reduction reactions, electrophilic and nucleophilic substitutions, carbon to carbon and carbon to heteroatom multiple bond additions, eliminations and rearrangements. Important concepts of laboratory techniques, library assignments, analysis, and characteristics of organic compounds. Laboratory 4 hrs/wk. *Prerequisite: Chemistry 37.* (3 units) NCX†

134. Advanced Organic Chemistry I (Heterocyclic Chemistry)

Synthesis and properties of five- and six-membered rings with one heterocyclic atom. Brief introduction to other classes. *Prerequisite: Chemistry 37.* (3 units) NCX†

135. Advanced Organic Chemistry II (Physical Organic Chemistry)

Molecular orbital treatment of organic molecules. Mechanisms. Structure/reactivity relationships. Photochemistry. Conservation of orbital symmetry. Applications of absorption spectroscopy to organic compounds. *Prerequisites: Chemistry 37 and Physical Chemistry.* (3 units) NCX†

136. Advanced Organic Chemistry III (Natural Products)

Synthesis, biosynthesis, and structure determination of acetogenins, isoprenoids, and alkaloids. Emphasis on reaction mechanisms and stereochemistry. *Prerequisite: Chemistry 37.* (3 units) NCX†

141. Biochemistry I

Chemical principles as applied to biomolecules: protein structure, enzyme function, carbohydrate and lipid metabolism, biological redox, and chemical models for enzymes. Biology topics will be deemphasized: cell structure and function, regulation of enzymes and protein synthesis, hormones and cell-cell interactions. *Prerequisite: Chemistry 37.* (4 units) NCX†

142. Biochemistry II

Continuation of 141 with laboratory. Metabolic pathways of amino acids and nucleotides, photosynthesis, nucleic acid structure and function, molecular genetics, molecular evolution, and membrane transport. Laboratory 6 hrs/wk. *Prerequisites: Chemistry 10 and 141.* (5 units) NCX†

150. Physical Chemistry for the Life Sciences

Principles of chemical thermodynamics with applications to biological systems. Laws of thermodynamics. Electrochemistry. Biological oxidations. Thermodynamics of solutions. Transport properties of macromolecules. Survey of spectroscopy. Intended for students majoring in the biological sciences. Does not count toward a major in chemistry. *Prerequisites: Chemistry 10 and 36 and Math 11.* (4 units) NCX†

151. Physical Chemistry I

Non-ideal gases. First law. Second law. Third law. Chemical potential. Clapeyron equation. Phase rule and diagrams. Classical thermodynamics. Computer programming. Laboratory 4 hrs/wk. *Prerequisites: Chemistry 10, Math 13, Physics 6 or 108, and completion of departmental computer requirement.* (4 units) NCX†

152. Physical Chemistry II

Kinetic theory of gases. Ideal and non-ideal solutions. Colligative properties. Transport processes. Electrochemistry. Chemical kinetics. Reaction mechanisms. Laboratory 4 hrs/wk. *Prerequisite: Chemistry 151.* (4 units) NCX†

153. Physical Chemistry III

Quantum chemistry. Particle in a box. Rigid rotor. Harmonic oscillator. Hydrogen-like atoms. Pauli principle and

†Exempted from challenge

term states. Fundamentals of spectroscopy. Laboratory 4 hrs/wk. *Prerequisite: Chemistry 152.* (4 units) NCX†

154. Nuclear Chemistry and Radiochemistry

Nuclear chemistry: nuclear structure, radioactive decay, nuclear reactions. Radiochemistry: interaction of radiation with matter, detectors, tracers in chemistry. *Prerequisites: Physical Chemistry or Nuclear Physics plus consent of instructor.* (3 units) NCX†

156. Statistical Thermodynamics

Equipartition of energy. Surface chemistry. Alternate statements of second and third laws. Ensembles. Entropy postulate. Partition function. Quantum statistics. Calculation of free energy function of ideal gases and solids from spectroscopic data. Ortho and para states. Use of computer. *Prerequisite: Chemistry 153.* (3 units) NCX†

171. Polymer Chemistry

Introduction to chemistry of macromolecules. Emphasis on synthetic polymers. Step-growth and chain-growth mechanisms. Kinetics and thermodynamics of polymerization. Characterization, morphology, fabrication, and testing of polymers. *Prerequisites: Chemistry 37 and 152.* (3 units) NCX†

172. Chemical Engineering

Introduction to practical aspects and fundamentals of chemical engineering. Fluid flow, heat transfer, evaporation, distillation, absorption, extraction, and other unit operations. Industrial equipment and economic considerations. *Prerequisite: Chemistry 152 or 150.* (3 units) NCX†

181. Introduction to Research

Selection of research goal and specific topic. Library search. Written report. Oral presentation. Regular attendance at seminars. Fall term. *Prerequisites: Chemistry 153 and foreign-language requirement satisfied.* (2 units)

182. Undergraduate Research

Execution of experimental or theoretical research as planned in Chemistry 181. Oral presentation. Written report. Regular attendance at seminars. *Prerequisite: Chemistry 181.* (3 units)

190. Advanced Topics in Chemistry

Special topics of current interest in chemistry not covered in detail in other courses. *Prequisites will depend on the specific topic being presented.* Not necessarily offered every year. (3 units) NCX†

199. Directed Research in Chemistry

Detailed investigation and directed reading on advanced topics, under the close supervision of a faculty member. Permission of the dean, department chair, and instructor must be obtained before registration. (Credit to be arranged.) NCX†

†Exempted from challenge

COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF CLASSICS

Professor Emeritus: George J. Sullwold, Jr.
Associate Professors: Barbara K. Gold, Helen E. Moritz *(Chair)*, William J. Prior (courtesy of Philosophy Department)
Assistant Professors: William S. Greenwalt, John David Pleins (courtesy of Religious Studies Department)
Lecturer: John R. Dunlap

Classics in the broad sense is the study of all aspects of the life and culture of ancient Greece and Rome. The Classics Department concentrates on the languages (ancient Greek and Latin) and literatures of those cultures and also offers courses in various aspects of ancient civilization. Instruction is also available in the language of the Old Testament, Biblical Hebrew.

A major in Classics prepares the student for graduate study in such fields as classical literature, classical archaeology, ancient history, comparative literature, and biblical studies. Teaching Classics at the high school or college level requires certification or an advanced degree. Because of the multidisciplinary nature of the field, Classics provides a general liberal arts curriculum that is an excellent background for careers in many areas.

Every course in the department is open to any interested student with the necessary preparation. Classics courses, such as Mythology, Classical Epic, and Women in Antiquity, require no knowledge of an ancient language. Latin, Greek, or Hebrew may be taken to satisfy the foreign-language requirement. Nonmajors preparing for graduate study in certain areas of history, philosophy, English, or scripture may wish to acquire a knowledge of Latin, Greek, or Hebrew as a research tool in those fields.

REQUIREMENTS FOR MAJOR

Majors are available in several programs in Classical Languages and Literatures—Latin, Greek, Latin and Greek, Latin or Greek and Biblical Hebrew—and in a multidisciplinary program in Classical Studies. A minor is offered in Latin, Greek, or Classical Studies. Because course offerings in any one term are limited, students wishing a Classics major are encouraged to plan their curriculum in consultation with a faculty adviser at the earliest possible date.

In addition to completing the major requirements specified below, Classics majors must fulfill University and Bachelor of Arts requirements (pages 31–33).

CLASSICAL LANGUAGES AND LITERATURES

These programs emphasize the study of ancient languages and the literature surviving in those languages and are supported by courses in other aspects of ancient literature and civilization.

Majors who plan to do graduate work in Classics should acquire at least a minimal familiarity with both Latin and Greek.

In addition to any lower-division courses in Latin, Greek, or Hebrew that the student may require, majors must complete the following courses:

Requirements for Major

Latin or Greek Nine upper-division courses in the language of concentration and a senior project (Classics 198)

Latin and Greek *or* ***Greek and Hebrew*** *or* ***Latin and Hebrew*** Nine upper-division courses in the ancient languages with at least six of these in a single language, and a senior project (Classics 198)

Students in these programs are strongly encouraged to fulfill the Western Culture requirement with English 11, 12, 13 (Literature I, II, III).

Recommended Electives

Lower Division Classics 65 (Classical Mythology); History 11 (Ancient); Philosophy 11 (Classical & Medieval); Art 11 (Art History I)

Upper Division Literature and culture courses in the Classics 180- and 190-series and history courses in the 110-series

Note: At least one course in Latin literature (numbers 120–139) and one course in Greek literature (numbers 150–169) are regularly offered each academic quarter. These courses are cycled in order to ensure majors the opportunity of studying the greatest number of major authors and genres without duplication during their program. Although each of the upper-division courses in Latin and Greek is ordinarily offered at least once in three or four years, listing in the *Bulletin* does not guarantee that a course will be offered in any given year. The elementary and upper-division sequences in Biblical Hebrew will ordinarily be offered in alternate years.

CLASSICAL STUDIES

For students interested in the bases of Western civilization, this program offers a broad curriculum in language, literature, history, philosophy, and art unified by a concentration on the classical periods in ancient Greece and Rome. Courses in Latin or Greek language and in classical literature (in the original or in translation) are its core, but the program emphasizes a comprehensive understanding of the foundations of Western culture rather than a single discipline.

Requirements for Major

1. Minimum of *five* courses in Latin or Greek, which may include the elementary sequence (this simultaneously fulfills the foreign language requirement for the Bachelor of Arts degree). Students entering with prior study of Latin or Greek may substitute up to two courses in Classical Literature with *advance* approval of the department chair.
2. Additional lower-division requirements: Classics 65 (Classical Mythology); English 11, 12, 13 (Literature I, II, III); History 11 (Ancient); Philosophy 11 (Classical & Medieval); Art 11 (Art History I)
3. Additional upper-division requirements—six courses, distributed as follows:
   a. Two courses in classical literature: at least one from Classics 182, 183, 186; the other from these or from the Classics 120-, 130-, 150-, and 160-series (upper-division Greek and Latin literature)
   b. One course in classical culture from Classics 181, 184, 185, 187, 188, 191; Political Science 111 (History of Political Theory)
   c. One additional course in classical literature or culture
   d. Two courses in ancient history from Classics 110 (Ancient Greece), 111 (Alexander the Great and His Legacy), 112 (Roman Republic), 113 (Roman Empire), 115 (Greek Democracy), 180 (Topics in Ancient History), and 190 (Seminar in Ancient History)
4. Classics 198 (Senior Project)

Recommended Electives

Upper Division Additional courses from those listed above or from English 143, 145, 146, 161, 162, 163; Art 174; or Theater and Dance 134

Teaching Authorization in Latin

The state of California authorizes the teaching of Latin as a second subject for holders of a single-subject instruction credential in another subject (e.g., English or a modern language) who have completed 30 quarter units or 15 upper-division quarter units of college course work in Latin. Students interested in teaching Latin in California public schools should consult the Classics chair about their program at the earliest possible date.

LATIN

11, 12. Elementary Latin I, II

Introduction to vocabulary, forms, and grammar of classical Latin. Development of reading skills with supporting exercises in writing. No language laboratory.

13. Elementary Latin III

Completion of Latin grammar. Introduction to reading Latin literature.

101. Advanced Latin I

Rapid review of Latin grammar. Especially for students wishing to refresh their high school Latin.

102. Advanced Latin II

Reading in a variety of Latin prose and poetry. Recommended entry course for

most students with four years of high school Latin.

121. Caesar

Representative selections from the *Commentarii* on the Gallic War and/or the *Bellum Civile.* Consideration of the adaptation of history to political ends.

122. Catullus

Lyric poems, short epigrams, and longer mythological poems by the late Republican poet of personal love and sophisticated society.

123. Roman Comedy

One or more plays by Plautus or Terence. Origins and nature of Roman comedy.

124. Ovid

Selections from the major works, which include love poems, *Amores;* a handbook for amatory success, *Ars Amatoria;* and the epic compendium of mythology, the *Metamorphoses.*

125. Cicero: Philosophical Works

Consideration of Cicero's eclectic philosophy through a careful reading of one or more of his philosophical dialogues, e.g., *De Amicitia, De Senectute,* or the *Dream of Scipio.*

126. Cicero: Oratory and Rhetoric

One or more exemplars of Cicero's rhetorical style (e.g., Catilinarian Orations, *Pro Archia*) or rhetorical theory (e.g., *De Oratore*). Consideration of rhetorical form, figures, and *topoi.*

127. Vergil: Aeneid

The epic poem on the effort of founding Rome and the cost of its greatness. Consideration of the traditional and innovative features of Vergil's epic style and purpose. Attention to epic metre.

131. Vergil: Eclogues and Georgics

Vergil's earlier works: pastoral poems set in an idealized landscape and the didactic poem on the agriculture and countryside of his native Italy.

132. Horace

Selections from the odes and epodes. Attention to the adaptation of Greek lyric forms and rhythms to the Latin language.

133. Livy

Selections from the *Ab Urbe Condita*—the history of Rome from its semimythical founding through monarchy, early Republic, and Punic Wars.

134. Roman Satire

Representative selections from among the works of Horace, Juvenal, and others. Origins and development of the satiric mode in Latin literature.

135. Medieval Latin

Major works of prose and poetry from the fourth century to the Renaissance. St. Augustine's *Confessions;* the histories of Gregory of Tours, Bede, and Einhard; Latin fables; popular songs such as the *Carmina Burana;* and the humanistic writings of Dante and Petrarch.

136. Latin Composition

Systematic practice in Latin prose syntax and idiom.

137, 138. Special Topics: Poetry Special Topics: Prose

Occasional courses in selected authors or genres for advanced students. Possible topics: Lucretius or elegy in poetry; Cicero's letters, Tacitus or other Roman historians in prose.

GREEK

21, 22. Elementary Greek I, II

Introduction to vocabulary, forms, and grammar of Attic Greek. Development of reading skills with supporting exercises in writing. No language laboratory.

23. Elementary Greek III

Completion of Greek grammar. Introduction to reading Greek literature.

105. Advanced Greek I

Rapid review of Greek grammar in the context of reading selected excerpts from Greek prose and poetry. *Prerequisite: 23 or equivalent.*

106. Advanced Greek II

Greek readings comprising an introductory survey of major authors and genres.

151. Lucian

Selections from the author's satirical treatments of mythology, history, philosophy, and rhetoric (e.g., *Dialogues of the Dead*) and/or from the fantasy called *A True Story.* Lucian's place in the Second Sophistic.

152. Homer: Odyssey

Selected passages demonstrating the fusion of the heroic and the romantic in an epic of peacetime. Consideration of epic metre and conventions.

153. Euripides

A complete tragic drama. Attention to characterization, dramatic structure, and poetry, and to Euripides' place in the history of tragedy. Metrical reading of dialogue.

154. Herodotus

Selections from the *Persian Wars.* Herodotus' achievements and limitations as the "Father of History." Peculiarities of the Ionic dialect.

155. Plato

Careful reading from one or more dialogues such as *Apology, Crito, Phaedo,* and *Republic.* Detailed study of dialogue mode of discourse; overview of Plato's philosophy.

161. Homer: Iliad

Selected passages illustrating the course and consequences of the Wrath of Achilles and the nature of the hero. Consideration of epic metre and conventions.

162, 163. Sophocles; Aeschylus

A complete tragic drama. Attention to characterization, dramatic structure, and poetry, and to the author's particular contributions to the development of the tragic form. Metrical reading of the text.

164. Oratory

Selections from a representative Greek orator such as Demosthenes or Lysias. Consideration of classical rhetorical forms and *topoi.*

165. Lyric Poetry

Fragments of Alcaeus, Archilochus, Sappho, Simonides, and others. Development of elegiac, iambic, and melic forms.

166. Greek Composition

Systematic practice in the syntax and idiom of Attic prose.

167, 168. Special Topics: Poetry Special Topics: Prose

Occasional courses in selected authors or genres for advanced students. Possible topics: Hesiod or Pindar in Poetry; Thucydides or New Testament readings in Prose.

BIBLICAL HEBREW

41, 42. Biblical Hebrew I, II

Introduction to the grammar and idiom of Biblical Hebrew. Acquisition of vocabulary, forms, and syntax based on selected readings in the Hebrew Bible.

43. Biblical Hebrew III

Completion of the grammar of Biblical Hebrew. Introduction to sustained reading in Hebrew literature.

141. Pentateuch

Readings in the narrative, ritual, and legal literatures of the first five books of the Hebrew Bible. Examination of the conventions of Hebrew narrative genres. Consideration of the role of the ancestors in the development of biblical tradition.

142. Hebrew Narrative and Poetry

Selections of narrative material from the Books of Samuel and Kings. Readings of poetic texts from the prophetic writings and the Psalms.

143. Biblical Aramaic

Introduction to comparative Hebrew and Aramaic grammar. Readings from Ezra and Daniel.

CLASSICS

Note: No knowledge of an ancient language is necessary for the following courses.

50. Technical Terminology

Introduction to technical vocabularies, especially in life sciences, through their roots and origins in Greek and Latin.

60. Classical Culture/Honors

A multidisciplinary introduction to the origins of Western culture in ancient Greece and Rome. Emphasis on classical literature and philosophy in their historical context. Substitutes for English 11, History 11, or Philosophy 11 for students in the University Honors Program.

61. Survey of Classical Literature

Historically and culturally based survey of major Greek and Latin authors from Homer through St. Augustine. Introduction to the principal literary genres of antiquity, epic, tragedy, comedy, philosophical dialogue, and satire. (Also listed as English 11.)

62. Survey of Ancient History

Interdisciplinary survey of the development of Western culture from the Near Eastern origins of Western civilization through the collapse of the Roman Empire. (Also listed as History 11.)

65. Classical Mythology

Principal gods and heroes of Greek and Roman antiquity: their stories, significance, and pictorial representations. Implications of myth in society and possible origins of myth. Important background for European and English literature. (Also listed as English 65.)

110. Ancient Greece

A survey of Hellenic history from the Bronze Age to Alexander the Great emphasizing the rise and fall of the polis as an independent social, cultural, and political community. (Also listed as History 110.)

111. Alexander the Great and His Legacy

An evaluation of the character, career, and legacy of Alexander the Great in light of his reign of thirteen years, its background, and the world that emerged after he spread Greek culture from Italy to India.

112. Roman Republic

Rome from the origins of the city to the collapse of the Republic and the establishment of a military dictatorship. (Also listed as History 112.)

113. Roman Empire

A political, social, and cultural survey of the Roman Empire beginning with Augustus and tracing changes in Rome from the development of the Roman Empire as a world state to the development of Christianity as a world religion. (Also listed as History 113.)

115. Greek Democracy

An investigation of the Greek origins of democratic institutions and of the strengths and weaknesses of ancient democratic regimes.

180, 181. Topics in Ancient History, Topics in Ancient Philosophy

Occasional courses in specialized topics. Consult current course descriptions for details.

182. Classical Tragedy

Representative works of the principal Greek tragic playwrights: Aeschylus, Sophocles, and Euripides. Features of the tragic genre, its origins, and the conventions of its performance. At the discretion of the instructor, may include satyr drama and/or the Roman tragedy of Seneca. (Also listed as English 110 and Theatre and Dance 110.)

183. Classical Epic

The *Iliad* and *Odyssey, Argonautica,* and *Aeneid* in translation. Characteristics and historical development of epic genre and epic hero. (Also listed as English 184B.)

184. Women in Antiquity‡

Greek and Roman women from prehistoric times through the Roman Empire, from domestic, legal, and cultural perspectives. Special attention to select women of note. (Also listed as English 184A.)

185. Ancient Greek and Roman Religion

Pagan religious culture in the Classical Mediterranean world. Consideration of the differing religious attitudes and expectations of polytheisms and monotheisms, and of religious expression in the context of cult and ritual. (Also listed as History 114 and Religious Studies 187.)

186. Ancient Comedy, Wit, and Humor

An investigation of the various styles of and approaches to humor in the ancient Greek and Roman world, as seen through the genres of comedy, satire, spoof literature, and invective. Besides the works of the comic dramatists (e.g., Aristophanes and Plautus) and satirists (e.g., Petronius and Juvenal), the course considers satyr drama, epigram, and "novellas" such as Lucian's *A True Story* and Apuleius' *Golden Ass.* (Also listed as English 111 and Theatre & Dance 111.)

187. Introduction to Classical Archaeology

Survey of the development of classical archaeology from Schliemann to contemporary excavation. Investigation of major archaeological sites in classical lands (e.g., Knossos, Mycenae, Athens, Vergina, Rome, Pompeii) and their significance for history and art. Archaeological problems and methods connected with these sites.

188. Art and Architecture of the Classical World

Architecture, sculpture, and painting from the Archaic through the Roman period, with special emphasis on major artists and monuments such as the Parthenon, the Altar of Zeus at Pergamon, Trajan's column; the sculptors

‡Course included in Women's Studies program

Polykleitos and Lysippos; and the painters Parrhasios and Zeuxis and how they reflect artistic developments and classical culture. (Also listed as Art 170.)

190, 191. Seminar in Ancient History, Seminar in Ancient Philosophy

Intensive study of and research in selected periods, authors, or problems. Consult current course descriptions for details.

198. Senior Project

Directed research project and paper for senior Classics majors.

199. Directed Reading or Research

Individually designed programs of reading or research, in Latin, Greek, or Classics (i.e., literature in translation or culture). Available to the advanced student. Written permission of the instructor, department chair, and dean required in advance of registration.

COLLEGE OF ARTS AND SCIENCES
COMBINED SCIENCES

The College of Arts and Sciences offers a program designed for those students who wish to incorporate the study of the social and natural sciences. Completion of the program merits a Bachelor of Science degree in Combined Sciences.

Students who wish to take a combined sciences program must fulfill the general requirements of the College of Arts and Sciences for their particular areas of emphasis in the natural and social sciences. Special waiver programs exist for those who wish to teach biology, chemistry, and physics at the high school level. The Bachelor of Science degree in Combined Sciences in life sciences/biology, chemistry, and physics has been approved by the state of California teacher training and licensing program as a waiver from the single-subject examination.

The emphasis program in life sciences/biology comprises five biology courses, four chemistry courses, three calculus courses, and two physics courses (all at the lower-division level) for a total of 44 units; and four biology courses, one chemistry course, and upper-division electives in these areas for a total of at least 25 units. The emphasis program in chemistry comprises six lower-division chemistry courses, four lower-division physics courses, and three calculus courses for a total of 52 units; and six upper-division chemistry courses, upper-division electives, and one earth sciences course. The emphasis program in physics comprises five physics courses, four chemistry courses, and three calculus courses for a total of 48 lower-division units, plus five upper-division physics courses, one upper-division chemistry course, and two upper-division electives in any area for a total of 40 units. In addition to the science requirements listed above, students must complete the University Curriculum and seven social science courses.

For details, students should consult the coordinators of Combined Sciences: Dr. Joseph Deck, Department of Chemistry, and Dr. John Drahmann, Department of Physics.

COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF COMMUNICATION

Associate Professor: Thomas E. Shanks, S.J. *(Chair),*
Assistant Professors: Christine M. Bachen, John H. McManus, Paul A. Soukup, S.J.
Senior Lecturers: Patricia J. Bendigkeit, John A. Privett, S.J.
Lecturer: Miriam A. Schulman

The Department of Communication offers a program of studies leading to a Bachelor of Arts in Communication with an emphasis in television or in print media. The major prepares students for graduate studies in communication theory or media and for careers in the communication industry. An academic minor is also available.

The communication major focuses on the *process* of communication in interpersonal and mass media contexts. It explores the theory, research methodologies, responsibilities, and effects of mass and interpersonal communication. The department gives special consideration to new and developing communication technologies.

The major integrates theory with practice. It allows students to apply their knowledge of the communication process to the study and creation of communication *products* (speeches, television programs, newspaper stories, etc.). Courses in basic and advanced public speaking are a special concern of the department.

The communication curriculum provides nonmajors with the opportunity to acquire a critical understanding of the communication process and contemporary media, to improve oral and written skills, and to heighten visual awareness.

REQUIREMENTS FOR MAJOR

Requirements in Arts and Sciences

Students are expected to complete University Curriculum and College requirements. In addition, communication majors must complete:

1. One statistics course (for example, Mathematics 8)
2. One introductory computer course (for example, Communication 12, Mathematics 10, or Decision and Information Sciences 17)

Requirements in Communication

Lower Division All students complete Comm 1 (Introduction to Communication Processes), Comm 10 (Communication Research Methods I), one course in public discourse (Comm 20, 23, or 25), Comm 30 (Television Production I), and Comm 40 (News Writing and Reporting I). Students who plan to emphasize television also complete Comm 31 (Television Production II). Students

who plan to emphasize print media complete Comm 41 (News Writing and Reporting II).

Upper Division All students complete Comm 100, 101 (Communication Theory and Effects I and II), Comm 110 (Senior Thesis), and Comm 170 (Communication Law and Responsibility). Students then choose to emphasize either television or print as an applied media area.

Television Emphasis students complete Comm 130 (TV Writing), Comm 133 (TV Directing), Comm 136 (TV Production Planning), and one Communication Department elective chosen with the help of a faculty adviser.

Print Emphasis students complete Comm 145 (Print Editing), Comm 146 (Public Affairs Reporting), Comm 148 (Design for Print), and one Communication Department elective chosen with the help of a faculty adviser.

ADVISING

Because the communication field requires students with a broad liberal arts education, students work closely with a faculty adviser to plan a cohesive academic program that combines courses in the Communication Department and in a variety of other departments. Academic programs are planned to fit the student's interests.

All students are encouraged to complete at least a year of serious work on one of the student-run media on campus. Special credit practica for such work may be included in the student's academic program.

Additionally, all junior or senior students are encouraged to complete an internship at an off-campus media organization. The department maintains a list of potential internships that may be completed for credit as Communication 198.

LOWER-DIVISION COURSES

1. Introduction to Communication Processes

Overview of the process of communication; effects and responsibilities of interpersonal and mass communication. Special consideration of new technologies and various communication models.

10. Communication Research Methods I

Introduction to communication as a social science and to methods for analyzing audiences, communication messages, and effects. Design, sampling, and basic computer data analysis. *Prerequisites: Comm 1 and Comm 20, 23, or 25.*

12. Technology and Communication

Introduction to use of technology in communication study and practice. Fundamental computer concepts. Basic programming. History, uses, equipment, and societal effects. *Prerequisite: Comm 1.*

20. Public Speaking

Introduction to oral communication theory and practice: the role of the speaker, audience factors, and elements of the message that create an effective speech.

23. Oral and Written Communication

Theory and practice of clear, concise, written and oral communication to inform and to motivate. Messages directed

to a specific audience in personal and professional situations.

25. Group Processes

Theory and practice of small task-oriented groups. Leadership skills, Interpersonal dynamics. Critical thinking and problem solving.

30. Television Production I

Basic theory and technique of television. Camera operation, audio, scripting, staging, and basic directing. Studio production experience.

31. Television Production II

All studio and portable equipment. Basic TV aesthetics, lighting, editing, language, and procedures necessary for directing. *Prerequisite: Comm 30.*

40. News Writing and Reporting I

Introduction to print journalism and press theories. Fundamentals of news evaluation, news gathering, and news stories. Basic theory and skills for reporting spot news and in-depth stories. *Prerequisites: English 1 and 2.*

41. News Writing and Reporting II

Advanced news writing and reporting. Specialized and depth reporting (sports, business, public affairs). Feature writing. *Prerequisite: Comm 40.*

55. Photojournalism I

Basic photography for print media. Camera, flash, and black and white processing and printing. Principles of photojournalism.

90. Photojournalism Practicum

A 1-unit course for editors and principal staff members of the University yearbook, *The Redwood.* Principles of photojournalism, graphic design, and book production. Discussion of significant work in progress.

92. Forensics Practicum

A 1-unit course for members of the speech and debate team. Supervised activity in forensics. Competition in debate and speaking events: persuasive, expository, extemporaneous, impromptu speaking, oral interpetation. Field trips required. *Prerequisite: permission of instructor.*

95. Journalism Practicum

A 1-unit course for editors and principal staff members of the University newspaper, *The Santa Clara.* Review of student writing. Practical advice and experience in journalism.

97. Communication Practicum

A 2-unit course for participants in department activities. Includes crew members, actors, researchers, teaching assistants, and others as approved by instructor. *Prerequisite: permission of instructor or chair.*

UPPER-DIVISION COURSES

100. Communication Theory and Effects I

Theories and effects of communication on individuals, emphasis on interpersonal communication. Meaning and codes. Symbolic interactionism. Rules theory. Self-disclosure. Gender issues. *Prerequisite: Comm 1.*

101. Communication Theory and Effects II

Continuation of Comm 100. Mass communication theories and effects. Special study of audiences. Effects models, information seeking, uses and gratifications, agenda setting, cultural norms theory. Consideration of theories and potential effects of new technologies. *Prerequisite: Comm 100.*

110. Senior Thesis

Advanced qualitative and quantitative approaches to communication. Content analysis. Advanced survey analysis. Ethical issues in communication research. Major quantitative research project that involves study design, data collection, computer processing, and report writing. *Prerequisites: Comm 10 and 101, statistics, computer course.*

120. Persuasive Speech

Rhetoric's humanizing role in U.S. social, political, and economic institutions. Critical thinking and speaking skills. Rhetorical analysis of speeches by public figures. *Prerequisite: Comm 20 or permission of instructor.*

130. Television Writing

Creation of scripts for commercials, public service announcements, educational programs, and documentaries for television. Basics of formative research and television aesthetics. Ethics of television writing. *Prerequisite: Comm 31 or permission of instructor.*

133. Television Directing

Advanced principles and techniques of television directing. Advanced TV aesthetics, working with performers, and the direction of various formats. Working with producers. *Prerequisite: Comm 31.*

136. Television Production Planning

Theory and practice of organizing a commercial, public, or industrial television program. Assessing audience needs, developing creative show ideas, preparing production material. Budgeting and clearances. Postproduction evaluation of effect on audiences. *Prerequisites: Comm 31 and 130.*

137. The Independent Producer

Theory and practice of free-lance production. Client meetings, script development, and production planning for state-of-the-art equipment. Professional budgeting. Problem solving. Field trips to local production houses required. *Prerequisite: Comm 136.*

138. Broadcast Journalism

Researching, writing, editing, and reporting radio and television news and documentaries. Ethics and law. *Prerequisites: Comm 130 and 133.*

139. Advanced TV Producing and Directing

Principles and techniques for advanced television projects. Creation of portfolio pieces. Remote surveys. Advanced lighting, film-style shooting, advanced editing, and budgeting. *Prerequisites: Comm 133, 136, and 138.*

145. Print Editing

News evaluation and selection; working with reporters; editing copy; headline writing; photography selection and captioning. *Prerequisite: Comm 41.*

146. Public Affairs Reporting

A senior-level writing course that provides the student an opportunity to observe and report on the workings of government, including courts, police, and social issues. *Prerequisite: Comm 41.*

148. Design for Print

Special languages used to attract and hold audiences for newspapers and magazines: writing styles, typography, layout, graphics, production principles. Impact on audiences.

152. The Language of Film

The art and craft of visual images, sound, and motion in film. Aesthetic analysis and criticism. Viewing of classic and contemporary films.

155. Photojournalism II

Issues and practice of documentary photography. Critical understanding of photography in print media. Writing and technical considerations necessary for photojournalism. *Prerequisite: Art 15.*

170. Communication Law and Responsibility

Legal and ethical standards for media. Responsibilities of communicators in interpersonal and mass communication. Case studies. Consideration of new technologies. *Prerequisite: Comm 1.*

172. Media Criticism

Methods of critical analysis of various media forms. Offered alternate years. *Prerequisite: Comm 1 or permission of instructor.*

180. Communication and Cultural Development

The impact of communication on culture, tracing shift from oral to print to electronic cultures. Special attention to rise of the newspaper, film, advertising, and television in the United States. Offered alternate years. *Prerequisite: Comm 1.*

181. The Communication Revolution

Introduction to new communication technologies: cable television, communication satellites, videotext, home VCRs, and teleconferencing. Uses and potential effects of telecommunication in an information age. *Prerequisite: Comm 1.*

190. Photojournalism Practicum

A 1-unit course for editors and principal staff members of the University yearbook, *The Redwood.* Principles of photojournalism, graphic design, and book production. Presentation and critique of significant work in progress.

192. Forensics Practicum

A 1-unit course for members of the speech and debate team. Supervised activity in forensics. Competition in debate and speaking events: persuasive, expository, extemporaneous, impromptu speaking, oral interpetation. Field trips required. *Prerequisite: permission of instructor.*

193. Computer Design Workshop

An interdisciplinary workshop in which engineering, art, and communication students learn to use graphics computers and software. Students work in teams to explore solutions to important social problems, use the computer to illustrate solutions, and complete formal presentations of their findings. Limited enrollment. *Prerequisite: permission of instructor.* (Also listed as Art 193 and MECH 193.)

195. Journalism Practicum

A 1-unit course for editors and principal staff members of the University newspaper, *The Santa Clara.* Review of student writing. Practical advice and experience in journalism.

197. Communication Practicum

A 2-unit course for participants in department activities. Includes crew members, actors, researchers, teaching assistants, and others as approved by instructor. *Prerequisite: permission of instructor or chair.*

198. Internship

Projects with recognized communication institutions outside the University. Written proposal must be approved by instructor and chair one week prior to registration.

199. Directed Research/Creative Project

Independent studies. Directed reading in communication theory, research, responsibilities. Creative projects in television, print, or another medium. Written proposal must be approved by instructor and chair one week prior to registration.

COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF ECONOMICS

Professors: Mario L. Belotti, William F. Donnelly, S.J., Alexander J. Field *(Chair)*, John M. Heineke, Hersh M. Shefrin, Thaddeus J. Whalen, Jr.
Associate Professors: Peter Chinloy, Henry G. Demmert, Thomas R. Russell
Assistant Professors: Richard T. Coz, S.J., Laurence R. Iannaccone, Linda Kamas, William A. Sundstrom
Acting Assistant Professor: Laurence Levin
W. M. Keck Foundation Professor: Mario L. Belotti

A social science primarily concerned with the production and distribution of society's material wealth, economics deals with production, pricing, and investment at the corporate and industry levels and with the problems of unemployment, inflation, income distribution, government spending and taxation, and economic efficiency at the national level. Economists are also concerned with international economic relations and with problems related to the economic development of Third World countries.

Because of its methodology and subject matter, economics provides an excellent background for the study of law. It is also acknowledged to provide the most useful and comprehensive academic preparation for entry into the MBA program.

The vast majority of graduates in economics enter careers in business; domestic and international banking; local, state, and federal governments; or private economic consulting. Many pursue graduate work in economics, law, business, and public policy.

REQUIREMENTS FOR MAJOR

Students majoring in economics, in addition to fulfilling the general requirements for a Bachelor of Science degree (pages 33–34), must complete the following departmental requirements:

Lower Division

1. Economics 1, 2, and 3 (Principles of Economics I, II, and III)
2. Economics 55 (Decision and Information Sciences 40 may be substituted)
3. Two math courses: Mathematics 11 (Calculus and Analytical Geometry I); and Mathematics 12 (Calculus and Analytical Geometry II)
4. One computer course (Decision and Information Sciences 17 or Electrical Engineering and Computer Science 4 or equivalent)

Upper Division

1. Economics 114, 115, 116, and 173 or 174

2. One course to be chosen from Economics 122, 128, or 180
3. One course to be chosen from Economics 120, 121, 124, or 126
4. Three upper-division economics electives

A minor in economics is offered by the Department of Economics through the College of Arts and Sciences.

SPECIAL PROGRAMS

Emphasis in Mathematical Economics

The Mathematics and Economics departments jointly offer a program providing an emphasis in mathematical economics. Students wishing to participate major in either mathematics or economics but pursue a course of study that emphasizes the use of mathematics in the study of economics. Participation in the program is noted on the student's transcript. This program is especially suited for students planning graduate work or careers in actuarial science, economics, mathematics, operations research, systems engineering, and related fields. The core of the program consists of Economics 114, 115, 170, 171, and 177; Mathematics 21, 22, 52, 53, 102; and either Economics 174 or Mathematics 122 and 123. With the permission of the Economics chair, students may substitute an economics elective for Economics 170 or 171. Full descriptions of the program may be obtained from the chairs of the Department of Economics or Mathematics.

Emphasis in Political Economy

The Economics and Political Science departments jointly offer a program providing an emphasis in political economy. Students wishing to participate major in either economics or political science but pursue a special course of study that emphasizes the interdependence of economics and political science in the analysis and solution of current domestic and world economic problems. Participation in this program will be noted on the student's transcript. This program is especially valuable to students planning graduate work or careers in public affairs, law, economics, and political science. The core of the program consists of Economics 114, 115, 116, 120, and 173 or 174; Political Science 150, 151, 165, and 167. Full descriptions of the program may be obtained from the chairs of the Department of Economics or Political Science.

LOWER-DIVISION COURSES

1. Principles of Economics I

Introduction to the general principles, terminology, and methods of macroeconomics.

2. Principles of Economics II

Introduction to the general principles, terminology, and methods of microeconomics.

3. Principles of Economics III

Contemporary economic issues and problems. Use of the methodology and tools learned in Economics 1 and 2 to investigate in detail some of the major economic issues of the day. *Prerequisite: Economics 1 and 2 or permission of the instructor.*

12. Economic History and Development

History and economic development with special attention to the North Atlantic community. Comparative institutions and economic systems.

55. Statistics

Introduction to statistical methods and techniques for both discrete and continuous random variables. *Prerequisites: Math 11 and 12.*

UPPER-DIVISION COURSES

Prerequisites: Economics 1 and 2, or permission of the Undergraduate Committee, are required for all upper-division courses.

114. Microeconomics I

Introduction to the theory of demand, production, cost, and pricing.

115. Aggregate Economic Theory

Macro, or aggregate, aspects of the economy, emphasizing modern macro-economic models for explaining the level of output, employment, and prices.

116. History of Economic Thought

Evolution of economic ideas and their influences on the development of economic practices. *Prerequisites: Economics 114 and 115.*

117. European Economic History

Study of the preindustrial environment and industrial growth patterns of Western Europe.

118. Comparative Economic Systems

Performance of market economies is contrasted to that of centrally planned, nonmarket economies and to that of "mixed" economies. The question of performance is addressed from both a theoretical and a practical point of view.

119. American Economic History

Study of growth and institutional change in the U.S. economy since colonial times. Topics include early industrialization, the economics of slavery, and the rise of large business enterprises and labor unions.

120. Economics of the Public Sector

Microeconomic analysis of the role of government in the market economy. Supply of public goods and services, government's role in controlling externalities and regulating private industry, and the economics of the political process. *Prerequisite: Economics 114.*

121. Microeconomics II

Applications of microeconomic theory to familiar economic problems. *Prerequisite: Economics 114.*

122. Money and Banking

Theoretical, institutional, and historical approach to the study of money and banking, with particular emphasis on the relationship between the monetary and banking system and the rest of the economy. (Students may not take *both* Economics 122 and Finance 126 for credit.)

124. Industrial Organization

Microanalysis of the structure, conduct, and performance of U.S. industry. *Prerequisite: Economics 114.*

126. Economics and the Law

Application of the tools of economic theory to the analysis of law and legal institutions as they exist in the contemporary United States. *Prerequisite: Economics 114 or permission of the instructor.*

127. Public Finance: Taxation

Analysis of various types of tax policies and their effect on the economy. Individual income taxes, corporate income taxes, consumption taxes, payroll taxes, state and local taxes, and other alternative forms of taxation.

128. Business Cycles and Forecasting

Study of the nature and causes of economic instability in an industrial economy.

129. Economic Development

Analysis of the historical and theoretical context underlying present efforts to increase the rate of economic growth in underdeveloped countries.

130. Latin American Economic Development

Examination of the economic development of Latin American countries, with particular emphasis on the relationships between economic growth and their social, political, and economic structures.

131. African Economic Development

Study of the economic development of Africa, with particular emphasis on the relationships between economic growth and African social, political, and economic structures.

132. Asian Economic Development

Study of the economic development of Asian countries with particular emphasis on the relationships between economic growth and their social, political, and economic structures.

134. Growth Dynamics and Planning

Study of various theoretical growth models and their application to development, planning, and project evaluation. *Prerequisites: Economics 114 and 115.*

135. Economic Development of Japan

Analysis of the historical development of the modern Japanese economy from the Meiji era to the present with an emphasis on the relationship between government, business, and labor.

140. Real Estate and Urban Economics

Examination of the economics of urban problems with emphasis on location and land use, the real estate market, and transportation. *Prerequisite: Economics 114 or permission of instructor.*

142. Economics of Natural Resources

Exploration of the supply of and demand for energy from national and international perspectives. Investigation of the relationship among energy use, economic growth, and the environment.

143. Real Estate

One quarter in senior year. Entails a research project on a specific program. Includes financing, marketing, development, and construction. (Open only to students admitted to the Real Estate program.)

144. Real Estate Studies Program Internship

One quarter spent as an employee of a real estate firm or lender. Students exposed to construction, appraisal, or financing. (Open only to students admitted to the Real Estate program.)

150. Human Resources Economics

Study of labor productivity, incomes, and employment and how these are affected by labor organizations and labor legislation.

161. The Economics of Poverty

Study of the economic conditions that lead to poverty and possible alternative policies directed at modifying such conditions.

162. Ethics and Economic Thought

Use of welfare economics to investigate the issues of distributive justice and market allocation. Topics include utilitarianism, Rawls's maximin principle, Nash fairness, and Arrow's impossibility theorem.

170. Mathematical Economics and Optimization

Generalization and reformulation of many familiar micro- and macroeconomic models as mathematical systems. Focus on exploring the properties of these models using mathematical techniques and on static models. *Prerequisites: Mathematics 11 and 12, Economics 114 and 115, or consent of instructor.*

171. Mathematical Economics: General Equilibrium Theory

Study of the mathematical model of market equilibrium. Existence, uniqueness, efficiency, core equivalence, dynamics, and growth.

173. Econometrics

Methods to analyze economic data. Time series data, index numbers, hypothesis testing, and simple regression. *Prerequisites: Economics 55 and DIS 17.*

174. Statistical Analysis

Foundations of statistical research methods, including distribution theory, estimation, testing and prediction, with special emphasis on multivariate models. *Prerequisites: Mathematics 11 and 12 or equivalent.*

177. Advanced Econometrics

Introduction to the techniques used by economists to estimate and test economic relationships. Focus on regression analysis, time series problems, and estimation of multiple equation models. *Prerequisite: Economics 174 or equivalent.*

180. International Economics

Analysis of the theory of international trade, problems in balance-of-payments adjustments, and international economics policies. *Prerequisite: Economics 114.*

182. International Business Economics

The institutions and processes influencing the environment for an enterprise involved in international business. Examination of the concepts, information sources, determinants of exchange rates, and evolution of the multinational corporation. Open only to nonmajors.

185. Economics of Technological Change

The economic consequences and causes of technological change. Examines a succession of technological and organizational breakthroughs and the developments that made these breakthroughs possible.

188. Economics Seminar

Modern economic theories and problems. Admission by invitation only.

198. Internship

Opportunity fo selected upper-division students to work in local governmental units or firms. *Prerequisite: upper-division standing and approval of the Undergraduate Committee.*

199. Independent Study

COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF ENGLISH

Professors Emeriti: Elizabeth J. Moran, George J. Sullwold, Jr.
Professors: James P. Degnan, Francis X. Duggan, William J. Rewak, S.J.
Associate Professors: Diane E. Dreher, Mary Judith Dunbar, Christiaan T. Lievestro, Carolyn A. Mitchell, Richard H. Osberg, Charles T. Phipps, S.J. *(Chair),* Frederick P. Tollini, S.J., Fred D. White
Assistant Professors: Marilyn J. Edelstein, Edward D. Gross, John C. Hawley, S.J., Theodore J. Rynes, S.J., Joseph L. Subbiondo
Acting Assistant Professor: Bruce S. Henderson
Senior Lecturers: Mary Ann Aschauer, Carol G. Rossi
Lecturers: Terry L. Beers, Simone J. Billings, Phyllis Brown, John R. Dunlap, Susan Frisbie, Edward Kleinschmidt, Claudia Mon Pere McIsaac, Cory Wade, Jeffrey L. Zorn
Lecturer and Scholar-in-Residence: James S. Torrens, S.J.

The Department of English provides students with a thorough undergraduate education in the liberal arts centered on the history, theory, and aesthetics of literature and the art of writing. The knowledge and skills developed in English courses are an excellent preparation for careers in law, government, business, communications, and education, as well as for graduate study in literature or writing.

REQUIREMENTS FOR MAJOR

In addition to University requirements and requirements for the Bachelor of Arts degree (pages 31–33), English majors must complete five lower-division English courses (not counting the three composition courses required by the College) and nine upper-division English courses. English majors ordinarily fulfill their composition requirements by taking English 9 and 10 and English 22 or 23.

The Department of English offers its majors two programs: a Language and Literature program, which provides students with a number of options, and a Single-Subject Credential program for students interested in teaching English in California secondary schools.

A minor in English is also available.

LANGUAGE AND LITERATURE PROGRAM

This program is especially suitable for students planning to enter law school or an MBA program and to do further study in journalism, language, or linquistics. It is also designed to meet requirements for graduate studies in literature, writing, or education. The heart of the program is a three-course sequence in closely related topics.

Lower-Division Requirements

Except as noted below, lower-division course requirements include the following five courses: English 11 (Literature I); English 21 (Introduction to Literature: Poetry); English 41, 42, and 43 (Survey of English Literature I, II, and III).

The Western Culture sequence (11, 12, 13) does not satisfy the University Curriculum requirement for English majors, who must follow a Western Culture sequence in the Art, History, or Philosophy departments.

Upper-Division Requirements

Students must distribute their nine required upper-division courses as follows:

1. Three courses from one of these groups:
   a. Medieval literature (103, 141, 142)
   b. Renaissance literature (113, 116–118, 143–145, 161)
   c. Post-Renaissance literature (114, 146–152, 155, 162)
   d. American literature (119, 131–139)
   e. Comparative literature (110–112, 141, 155, 161–167, 184A, 184B) or three courses in one foreign literature
   f. Fiction (134, 135, 151, 152, 167)
   g. Dramatic literature (110–119, 186)
   h. Language and linguistics (101–104)
   i. Writing (170–175, 177–181, 197)
2. One course in Shakespeare (116–118). If a Shakespeare course from groups b. or g. (above) has already been included, a course in Chaucer (142) or Milton (145) must be substituted to fulfill this requirement.
3. One upper-division course in American literature, if not already included in one of the above groups.
4. One senior seminar (188)
5. Upper-division elective courses, at least one of which must be an English period course (141–144, 146–149), if not already included from one of the above groups.

Recommended Electives

English 103, 104, 116, 117, 118, 123, 124, 142, 145

American Literature Emphasis

Students with a special interest in their American heritage may choose a further concentration in American literature. Their lower-division requirements are the same as above except that they may substitute the sequence 31, 32, 33 for the sequence 41, 42, 43, or one course from 31, 32, or 33 for 22 or 23. Nine upper-division courses that, in addition to one course in Shakespeare and a senior seminar, must include four courses in American literature, and two courses in British literature, one of which must be a period course.

Writing Emphasis

Students who look to writing as an important part of their future careers may choose a further concentration in writing. Their lower-division requirements are the same as above except that they may substitute one course from 70–76 for 22 or 23. Nine upper-division courses that, in addition to one course in Shakespeare, one in American literature, and a senior seminar, must include four courses from group 1i., above, and one British period course.

SINGLE-SUBJECT WAIVER PROGRAM

Students planning to teach English in secondary schools who complete the waiver program may be considered for a fifth-year credential program without taking the National Teacher Examination.

Waiver program requirements include course work in three areas: (1) writing, (2) literature, and (3) linguistics and oral communication. A course on the U.S. Constitution is also required.

Waiver program requirements are combined with the ordinary requirements of the English Department major programs as well as with College and University Curriculum requirements.

English majors in the waiver program ordinarily fulfill the first two freshman writing requirements by taking English 9 and 10. However, they ordinarily fulfill the third English requirement by taking English 180.

Lower-Division Requirements

1. English 11
2. English 21
3. A complete American or British literature sequence: either 31–33 or 41–43
4. Ethnic literature: English 35 or 66
5. Speech: Communication 20 or equivalent

Upper-Division Requirements

1. Two linguistics courses: English 101 and 102
2. One course in Shakespeare: English 116, 117, or 118
3. At least one course in British literature (if the lower-division sequence was in American literature) or one course in American literature (if the lower-division sequence was in British literature)
4. One senior seminar: English 188
5. Three English electives
6. Ethnic literature: English 166 or Spanish 133 (if a lower-division ethnic literature course has not already been completed)

Recommended electives

English 103, 104, 170–179, 197
Psychology 187

Education 98/198 (see Division of Counseling Psychology and Education)

HONORS PROGRAM

Students majoring in English may participate in the University Honors Program. The Department of English offers special courses or sections of courses restricted to Honors students. It also permits Honors students majoring in English to begin taking courses in their sophomore year ordinarily restricted to juniors and seniors.

Note: Authors and topics listed in the following course descriptions are typical rather than definitive. Not all of them are necessarily included in a respective course every time it is offered, and others not listed here may be included. Some courses are offered every year; all, ordinarily, are offered at least once every two years.

LOWER-DIVISION COURSES

1. Composition and Rhetoric I

Expository writing for college students. NCX†

2. Composition and Rhetoric II

Argumentation and research writing. *Prerequisite: English I or its equivalent.* NCX†

4, 5. Guided Writing I, II

Courses in composition for students with special linguistic needs that have become evident after they have completed English 1. Both courses must be taken to substitute for English 2. NCX†

6. English Syntax for Second-Language Students

Practice in grammatical forms and structures within a communicative context. Attention to styles and varieties of forms in American English. Students are graded P/NP only. (2 units) NCX†

7. Writing for International Students I

Practice in expository writing. Includes study of rhetorical principles, organization, and vocabulary development. Substitutes for English 1. NCX†

8. Writing for International Students II

Continuation of English 7. Focus on writing in different academic disciplines. Includes a major research paper. Substitutes for English 2. NCX†

9, 10. Critical Composition I, II

Composition in literary topics for freshman English majors and for freshmen in the University Honors Program. Substitutes for English 1 and 2. NCX†

11, 12, 13. Western Culture: Literature I, II, III

Historical survey of Western literature from the ancient Greeks to the twentieth century. Satisfies the University Curriculum humanities requirement for students who are not English majors.

†Exempted from challenge

21. Introduction to Literature: Poetry

Introduction to the study of poetry through critical reading and analysis.

22. Introduction to Literature: Drama

Introduction to the study of drama through critical reading and writing.

23. Introduction to Literature: Fiction

Introduction to the study of the novel and the short story through critical reading and writing.

27. Contemporary Novel

Readings in selected novels of the past decade.

31, 32, 33. Survey of American Literature I, II, III

Historical study of American literature from colonial times to the present.

35. Afro-American Literature§

Readings in the black literature of America.

41, 42, 43. Survey of English Literature I, II, III

Readings in the history of English literature from the beginnings to the present. Emphasis on the history of ideas and on the major authors.

54. Shakespeare

Readings in selected major plays.

65. Classical Mythology

See Classics 65.

66. African Literature

Readings in the contemporary literature of black sub-Saharan Africa.

67. Modern Novel

Readings in selected twentieth-century novels.

68. Women's Literature‡

Introduction to the study of literature by and about women.

70. Introduction to Creative Writing

Instruction and practice in the writing of poetry and fiction. *Prerequisites: English 1 and 2.* NCX†

71. Introduction to Fiction Writing

Introduction to the writing of fiction. *Prerequisites: English 1 and 2.* NCX†

72. Introduction to Poetry Writing

Introduction to the writing of poetry. *Prerequisites: English 1 and 2.* NCX†

73. Introduction to Magazine Writing

An introduction to the writing of articles, book reviews, and interviews. NCX†

74, 75. Journalism I, II

See Communication 40, 41.

76. Exposition

A writing course that continues to develop the expository writing skills of students who have satisfactorily completed their freshman composition requirements. *Prerequisites: English 1 and 2.* NCX†

79. Composition and Literature

Instruction and practice in writing expository prose. Combines writing instruction with a close reading of literary texts to serve as subjects and stimuli for writing. *Prerequisites: English 1 and 2.*

81, 82. Literary Topics I, II

Special topics in literature.

†Exempted from challenge §Course included in Ethnic Studies program
‡Course included in Women's Studies program

95.1. Journalism Practicum

See Communication 95.

95.2. Magazine Journalism Practicum

A 1-unit course for editors, staff, and principal writers on *The Owl*. Students meet weekly with a faculty member to discuss ways of improving the quality of student writing. Students are graded P/NP only. NCX†

UPPER-DIVISION COURSES

101. Linguistics

General survey of the science of linguistics: phonology, morphology, syntax, grammar, and usage.

102. Theories of Modern Grammar

Analysis of the basic problems of describing grammatical structure; traditional, structural, and transformational-generative grammars.

103. History of the English Language

Origin, structure, and development of the English language. Special attention to the morphology and syntax of Old English.

104. Teaching English as a Second Language (TESL)

Introduction to theories of instruction; survey of methods and materials used in the teaching of English to speakers of other languages. NCX†

110. Classical Tragedy

See Classics 182.

111. Classical Comedy

See Classics 186.

112. Modern Drama

See Theatre and Dance 112.

113. English Drama I

Non-Shakespearean drama in England to 1660. Medieval drama, Marlowe, Ford, Webster, Jonson.

114. English Drama II

Drama in England since the Restoration. Dryden, Wycherley, Congreve, Sheridan, Shaw, Eliot, and selected contemporary playwrights.

116. Shakespeare's Tragedies

117. Shakespeare's Comedies

118. Shakespeare's Histories

119. American Drama

See Theatre and Dance 119.

123. History of Literary Criticism

Literary criticism from Plato to the present.

124. Contemporary Critical Theory

Major movements in contemporary critical theory.

131, 132, 133. Studies in American Literature

Selected authors, movements, or problems in American literature. Since authors and topics change from year to year, courses may be repeated for credit with permission of the department chair.

134. American Novel I

The American novel in the nineteenth century. Authors may include Cooper, Hawthorne, Melville, Twain, James, Chopin, Crane, Dreiser.

†Exempted from challenge

135. American Novel II

The American novel in the twentieth century. Authors may include Dreiser, Cather, Fitzgerald, Hemingway, Faulkner, Ellison, Barth, and other recent novelists.

136. American Poetry I

Historical study of American poetry of the eighteenth, nineteenth, and early twentieth centuries. Taylor, Poe, Emerson, Longfellow, Whitman, Dickinson, Robinson, Frost.

137. American Poetry II

American poetry of the twentieth century. Pound, Eliot, Williams, Stevens, Lowell, and more recent poets.

139. California Literature

Literature written by Californians and/or about California.

141. Medieval Literature

English literature from its beginnings to 1485. Beowulf, medieval drama, Sir Gawain, Langland, Chaucer, Malory.

142. Chaucer

Study of *The Canterbury Tales* in the context of medieval literature and culture. Emphasis on Chaucer's language and style.

143. Renaissance Literature

Nondramatic literature of England from 1485 to 1603. Sidney, Spenser, Marlowe, Shakespeare, and others.

144. Seventeenth Century

Nondramatic literature of England from 1603 to 1660. Jonson, Donne, Herrick, Milton, Marvell, Herbert, Browne.

145. Milton

A study of Milton's major poetry and prose.

146. Neoclassical Literature

Literature of England from 1660 to 1798. Dryden, Pope, Swift, Johnson, Boswell.

147. Romantic Movement

Nondramatic literature of England from 1798 to 1832. Blake, Burns, Wordsworth, Coleridge, Byron, Shelley, Keats.

148. Victorian Literature

Poetry and nonfictional prose of England from 1832 to 1900. Macaulay, Carlyle, Tennyson, Browning, Newman, Ruskin, Arnold, Hopkins.

149. Modern British Literature

Nondramatic literature of England in the twentieth century. Hardy, Conrad, Lawrence, Eliot, Auden, Graves, Forster, Woolf, Joyce.

150. Contemporary Literature

British and American poetry, fiction, and drama since World War II.

151. English Novel I

The eighteenth-century English novel. Defoe, Richardson, Smollett, Sterne, Fielding, Austen.

152. English Novel II

The nineteenth-century English novel. Scott, the Brontes, Dickens, Thackeray, Eliot, Meredith, Butler, Hardy.

155. Irish Renaissance

Irish literature in English of the late nineteenth and early twentieth centuries. Yeats, Synge, Russell, Lady Gregory, Colum, O'Casey, Stephens, Joyce, O'Connor, O'Faolain.

161. Christian Humanism

Comparative readings in Renaissance literature. Erasmus, More, Montaigne, Petrarch, and Donne.

162. Classic and Romantic

Comparative readings in English and Continental Neoclassic and Romantic literature. Racine, Moliere, Pope, Wordsworth, Byron, Shelley, Keats, Heine, Schiller, Hugo, Chateaubriand.

163. The Don Juan Theme

Variations on eros and agape from Plato and the earliest Spanish Don Juan play to Moliere and Shaw. Comments by Rollo May and Erich Fromm.

165. The Bible as Literature

Genres, styles, and themes of the Bible.

166. Pan-African Literature§

Readings in the literature of the black diaspora. Writers from Africa, the Caribbean, and the United States. Slavery, negritude, and Pan-Africanism.

167. Modern Fiction

Selected works of continental, English, and American fiction that are peculiarly modern in sensibility or style. James, Proust, Joyce, Gide, Kafka, Mann, Woolf, Lowry, Faulkner.

168. Women's Literature‡

Studies in literature by and about women. Authors, genres, and themes change from year to year.

170. Play Writing

See Theatre and Dance 170. NCX†

171. Fiction Writing

Workshop in the writing of fiction. *Prerequisite: English 71 or permission of the instuctor.* NCX†

172. Poetry Writing

Workshop in the writing of poetry. *Prerequisite: English 72 or permission of the instructor.* NCX†

174. Literary Journalism

Writing for magazines and periodicals. Book reviews, satire, explication, and critical essays. *Prerequisites: English 73 or 76, or 74 and 75, or permission of the instructor.* NCX†

175. Magazine Writing

Writing articles for magazines and periodicals. Emphasis on controversial political, cultural, and scientific topics. *Prerequisites: English 73 or 76, or 74 and 75, or permission of the instructor.* NCX†

176. Intensive Writing

For upper-division students who have completed English 1 and 2 and who now seek to strengthen those skills necessary for clear and forceful communication in their major fields. English majors enroll only with permission of the chair. NCX†

177. Advanced Composition

Extensive practice in academic writing such as biography, reviews, and interviews. Emphasis on stylistic development. *Prerequisites: English 1 and 2.* NCX†

178. Argumentation

Argumentative and persuasive writing, ideal for students planning careers in business, politics, or law. *Prerequisites: English 1 and 2.* NCX†

179A. Report Writing

An introduction to formal technical communication designed especially for students planning careers in the sciences or engineering. *Prerequisites: English 1 and 2.* NCX†

179B. Report Writing

An introduction to formal professional communication designed especially for students planning careers in business. *Prerequisites: English 1 and 2.* NCX†

180. Writing for Teachers

Writing and the teaching of writing. Especially recommended for students planning careers in primary and secondary education. *Prerequisites: English 1 and 2.* NCX†

§Course included in Ethnic Studies program
†Exempted from challenge ‡Course included in Women's Studies program

181. Writing for Publication

Tutorial for superior writers from all disciplines, including sciences, business, and engineering. Enrollment by permission of the instructor. May be repeated once for credit. Flexible scheduling. NCX†

182. Communication for Engineers: Technical Writing and Oral Reports

Designed for engineering students. Teaches the skills necessary for effective technical communication, including problem analysis, audience analysis, planning, evaluation, revision, visual design, and oral presentation. NCX† (2 units)

183. Communication for Engineers: Evaluating Academic Writing

Designed for training teaching assistants in engineering to evaluate their students' writing. Teaches the theory, practice, and evaluation of engineers' academic writing. NCX† (2 units)

184. Special Topics

Major authors, genres, literary movements, or themes.

184A. Women in Antiquity‡

See Classics 184.

184B. Classical Epic

See Classics 183.

186. Special Topics in Drama

See Theatre and Dance 186.

186A. Theatre Criticism

An introduction to the theory and practice of stage and film criticism and reviewing.

186B. Ancient Comedy, Wit and Humor

See Classics 186.

187. Special Topics in Literary Criticism

188. Senior Seminar

Seminar in English or American literature for senior English majors. NCX†

189. Honors Seminar

Seminar for students in the University Honors Program and other invited students. Since topics change from year to year, this course may be repeated for credit with permission of the department chair. NCX†

195.1. Journalism Practicum

See Communication 195.

195.2. Magazine Journalism Practicum

A 1-unit course for editors, staff, and principal writers on *The Owl.* Students meet weekly with a faculty member to discuss ways of improving the quality of student writing. Students are graded P/NP only. NCX†

197. Practicum in Tutoring Composition

For students of any major who wish to strengthen their writing skills by assisting freshman writers. Prospective students should consult the director. NCX†

198. Writing Internship

Work-study program for students of superior writing ability who gain course credit by supervised writing on newspapers, magazines, or for government or private agencies. Enrollment is by permission or invitation of the director and department chair. May be repeated once for credit. Students are graded P/NP only. NCX†

199. Directed Reading/Directed Research

In special circumstances and with the permission of the department chair and

†Exempted from challenge ‡Course included in Women's Studies program

the dean of the College, a student may request of an instructor a course in directed reading or writing. May not be taken in a subject listed in this bulletin. NCX†

†Exempted from challenge

COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF HISTORY

Professors Emeritus: Matt S. Meier
Professors: Mary McDougall Gordon, Norman F. Martin, S.J.
Associate Professors: Ramon D. Chacon, Steven M. Gelber, George F. Giacomini, Jr., Gerald McKevitt, S.J., Istvan I. Mocsy, Barbara Molony, Timothy J. O'Keefe, Gary Y. Okihiro, Peter O. Pierson *(Chair)*, Robert M. Senkewicz, S.J., David E. Skinner, Thomas P. Turley
Assistant Professors: William S. Greenwalt (courtesy of Classics Department), Arthur F. Liebscher, S.J.
Lecturer: Jo Burr Margadant
Patrick A. Donohoe, S.J., Professor: Mary McDougall Gordon

History provides an understanding of all aspects of the human past. By synthesizing the humanities and social sciences, the study of history develops the ability to research, analyze, and communicate the reasons nations and peoples have evolved in particular ways. Knowledge and skills developed in history are excellent preparation for graduate study and careers in education, communications, government, law, and business.

REQUIREMENTS FOR MAJOR

In addition to the general requirements for the University and the Bachelor of Arts degree (pages 31–33), majors must pass twelve history courses that meet the following requirements:

1. Four lower-division courses
2. Eight upper-division courses
3. History 100 (Historical Methods)—may be the *fourth* lower-division or *ninth* upper-division course (recommended at end of sophomore or beginning of junior year)
4. One history seminar with History 100 as a prerequisite
5. Three courses in each of the following areas (requirement is not waived for those in a special emphasis program):
   a. United States history
   b. European history
   c. African, Asian, or Latin American history

A minor in history is also available.

SPECIAL EMPHASIS PROGRAMS

Students who want to concentrate on a particular area of history may pursue a special emphasis program. Enrollment in one of these programs is not required. History courses taken to fulfill area program requirements also fulfill history requirements. Further information is available from the department.

United States History Emphasis

Requirements

1. Three United States area courses selected from English, fine arts, music, religious studies, economics, political science, and anthropology/ sociology
2. History 77H or 197 and at least five other United States history courses

Recommended Spanish- or French-language competency

European History Emphasis

Requirements

1. Three European area courses selected from classics, political science, fine arts, philosophy, religious studies, French, German, Italian, Spanish, or English
2. History 192 or 193 and at least five other history courses in ancient, medieval, or modern Europe

African History Emphasis

Requirements

1. Two courses selected from English 66 (African Literature) or 166 (Pan-African Literature); Economics 131 (African Economic Development); Anthropology 3 (Introduction to Social and Cultural Anthropology); Religious Studies 91 (Slave Narratives) or 126 (Black Theology in the U.S.)
2. History 194 (Seminar in African History) and at least five other African history courses

Recommended French-language competency

Asian History Emphasis

Requirements

1. Three Asian area courses selected from Economics 132 (Asian Economic Development) or 135 (Economic Development of Japan); Political Science 135 (Far Eastern International Relations), 147 (Politics in Japan) or

148 (Politics in China); Religious Studies 76 (Hinduism and Buddhism), 77 (Chinese and Japanese Religions), or 147 (Zen Buddhism). *Note that Political Science 2 is a prerequisite for the upper-division political science courses.*
2. History 195 and at least five other Asian history courses, three of which must be upper-division courses

Recommended Japanese-language competency

Latin American History Emphasis

Requirements

1. Three Latin American area courses selected from Political Science 136 (Politics in Central America and the Caribbean) and 137 (Politics in South America); Spanish 115, 117, 130, 131, 135, 140, 145, 146; and Economics 130 (Latin American Economic Development)
2. History 196 and five other Latin American history courses

Recommended Spanish-language competency

HONORS PROGRAM

History majors having at least a 3.5 grade point average in history (and not less than a 3.3 overall grade point average) at the end of the second quarter of the junior year may be invited by the department to become history honors students. History honors students must write a Senior Honors Thesis under the direction of a professor. The thesis is worth 10 upper-division history units, but history honors students must also take a ninth upper-division course. Theses will be reviewed by a committee of three professors and, if found to be of honors quality, the student will be granted a bachelor's degree with honors in history.

SINGLE-SUBJECT CREDENTIAL OR WAIVER PROGRAM

The state of California requires that persons seeking a credential to teach history in California secondary schools, besides completing a fifth year of studies and student teaching, either pass the National Teacher Examination in Social Science or complete a state-approved waiver program of study in history. Santa Clara University offers a state-approved program.

The program at Santa Clara consists of fifteen courses totaling 69 units. Waiver candidates will be required to take nine upper-division courses (45 units) and six lower-division courses (24 units). These courses must be taken in the following areas of historical study commonly taught in the public schools: U.S. History, California History, History of Western Civilization, World History, History of Modern Europe, and History of the Non-Western World. The areas of study and course work are the following: five approved courses in U.S. History (California History included); five approved courses in the following areas: History of Western Civilization, World History, and Modern Europe;

five approved courses in the Non-Western World. Students who wish to participate in the waiver program should consult the chair of the History Department at an early date.

WORLD AND COMPARATIVE HISTORY

25. Twentieth-Century World Wars

A study of the causes, conduct, and results of World Wars I and II and their place in modern history. Civilian and military leadership and the chief campaigns and battles.

26. Modern Revolutions

Comparative study of the causes, successes, and failures of selected revolutions and rebellions. Emphasis on revolutionary leadership, ideology, and organization.

103. Technology and Imperialism Seminar

Examination of the relationship between the development of technologies and imperial organization. Emphasis on the application of technologies to imperial expansion and control during the nineteenth and twentieth centuries and on how imperialism has contributed to the rise of new technologies.

104. War in World History to 1815

War in Western civilization from Greek and Roman antiquity to the French Revolution and Napoleon. Complex relationships among war, politics, values, social structures, economics, and geography. Battles and great commanders. War in thought, literature, and art.

105. War in the Modern World

War from the era of the French Revolution to the post–World War II period. Focus on the complex problems and conflicts of expansive nation-states in an age of unprecedented economic growth and technological innovation. Grand strategy, high command, and military and naval campaigns. Shifting attitudes of the modern mind facing the phenomenon of war.

109. African Americans and Africa§

Historical examination of the roots of African American culture and politics: the impact of the Atlantic slave.

191. Seminar in Comparative History

Historical seminars. Emphasis on original research and group discussions of selected problems and periods. *Prerequisite: History 100.*

198. Practicum

199. Directed Reading/Directed Research

Directed reading and research in source materials and secondary works dealing with selected historical problems in world and comparative history. *Prerequisite: permission of dean, department chair, and instructor.*

UNITED STATES HISTORY

7. United States: Colonies and Constitution

Introductory survey of American history from first European settlement through the Constitutional Convention. Political, economic, social, and intellectual aspects of America's first 200 years.

§Course included in Ethnic Studies program

8. United States: The Nineteenth Century

Introductory survey of U.S. history from the Constitutional Convention to the Spanish American War. Political, economic, social, and intellectual aspects of the century that saw the nation evolve from an infant state to an industrial world power.

9. United States: The Twentieth Century

Introductory survey of U.S. history from the Spanish American War to the present. Political, economic, social, and intellectual aspects of America in an era of international involvement and domestic change.

77H. Honors Seminar: United States

Selected problems in U.S. history. Methods of the historian. Restricted to University Honors Program students.

81. Chicanos in the Southwest§

Survey of the Chicanos in California and the Southwest. Emphasis on the period since 1848 and on Texas, New Mexico, and California.

83. Asian Americans§

Survey of Asians in Hawaii and the West Coast to about World War II. Precolonial Hawaii, imperialism in the Pacific, Asian contract and migrant labor, the anti-Asian movement, Asian American communities, and World War II.

100. Historical Methods

Required of all majors in last quarter sophomore or first quarter junior year. Includes research and writing of history papers.

170. The American Colonies

Development of religious, political, economic, and social institutions in England's North American colonies in the seventeenth and eighteenth centuries.

171. Revolution, Confederation, Constitution

Intensive study of the origins, progress, and culmination of the American Revolution to about 1800.

172. The New Nation

Social and political reforms, expansion and changes, sectional and national politics of the United States during the period between 1815 and 1850.

173. The Old South and Civil War

Intensive study of the Old South from the Revolution to the Civil War and Reconstruction. Emphasis on regional identity and the relationship of Southern history to the national experience.

174. Industrialism and Reform, 1877–1920

Growth of industrial America in the age of immigration. Populist response to the growth of urban power and attempts by Progressives to moderate the impact of big business. American involvement in World War I.

175. The Modern Era, 1920–1960

The end of the Republican ascendancy in the 1920s and the rise of the New Deal coalition. America at war again and the Cold War at home and abroad.

176. America in the 1960s

Little Rock to Watergate: social, political, and foreign policy upheavals of the 1960s. Civil rights movement, student and antiwar movements, hippies and others, Kennedy and Johnson, end of the Cold War and the war in Vietnam, Nixon and Watergate.

177. American Capitalism

Analysis of the philosophy and social impact of the capitalist idea as it developed in America from the colonial period to the twentieth century. Role of the

§Course included in Ethnic Studies program

businessperson, social mobility, and some anticapitalist ideas.

178. Twentieth-Century U.S. Diplomatic History

Critical study of the international relations of the United States. Economic, political, social, and public opinion forces influencing the development of U.S. policy.

179. Special Topics in U.S. History

Occasional lecture courses in special topics in United States history.

180. Life and Work in the American City

Development of urban centers in the United States and their effect on the lives of ordinary people.

181. U.S. Catholicism

The Catholic experience in America from colonial times to the present. Missions among the Indians, the English colonies, the church of the immigrants, the parish and local church, the Catholic response to industrialization, the Second Vatican Council.

182. Family in American History‡

History of the family in the United States from the seventeenth to the twentieth century. Impact of changing society on the family from birth to death. Particular focus on life stages, child rearing, and sexuality.

183. Social Movements in Twentieth-Century America

Popular movements for and against change. Investigation of the response of the American people to the problems of modern industrial society. Labor, women's rights, black activism, antiradicalism, Ku Klux Klan, peace movement, and others.

184. Women in American Society‡

Historical survey of women's experiences from the Puritan era to the present. Emphasis on class, race, and ethnic origins, and activist roles of women.

185. North American Indians§

History of Native Americans of the United States from European contact to the present. Emphasis on nineteenth- and twentieth-century developments.

187. The American West

The West as a factor in U.S. history, from the seventeenth century to the present. Emphasis on the nineteenth-century trans-Mississippi frontier.

189. California

Survey of the state's history: its Indian origins, Spanish invasion and missionization, Mexican period, U.S. conquest, gold rush, and development to the present. Major attention to nineteenth century.

197. Seminar in U.S. History

Historical seminars. Emphasis on original research and group discussions of selected problems and periods. *Prerequisite: History 100.*

198. Practicum

199. Directed Reading/Directed Research

Directed reading and research in source materials and secondary works dealing with selected historical problems in U.S. history. Only with permission of dean, department chair, and instructor.

§Course included in Ethnic Studies program ‡Course included in Women's Studies program

EUROPEAN HISTORY

11. Western Civilization: Ancient

Interdisciplinary survey of the development of Western culture from the Near Eastern origins of Western civilization through the collapse of the Roman Empire. May be taken by all nonhistory majors to fulfill one part of the Western Culture requirement. Open to all students.

11H. Western Civilization Honors

A multidisciplinary introduction to the origins of Western culture in ancient Greece and Rome. Emphasis on classical literature and philosophy in their historical context. Restricted to University Honors Program students.

12. Western Civilization: Medieval and Early Modern

Interdisciplinary survey of the development of Western culture from the fall of the Roman Empire to the age of Louis XIV. May be taken by all nonhistory majors to fulfill one part of the Western Culture requirement. Open to all students.

12H. Western Civilization Honors

Selected problems in medieval and early modern European history. Methods of the historian. Restricted to University Honors Program students.

13. Western Civilization: Modern

Interdisciplinary survey of the development of Western culture from 1715 to the present. May be taken by all nonhistory majors to fulfill one part of the Western Culture requirement. Open to all students.

13H. Western Civilization Honors

Selected problems in modern European history. Methods of the historian. Restricted to University Honors Program students.

110. Ancient Greece

Greece from the Minoan period to the death of Alexander the Great.

111. Special Topics in Ancient History

Occasional lecture courses in selected topics in ancient history.

112. Roman Republic

Rome from the origins of the city to the collapse of the Republic and the establishment of a military dictatorship.

113. Roman Empire

A political, social, and cultural survey of the Roman Empire beginning with Augustus and tracing changes in Rome from the development of the Roman Empire as a world state to the development of Christianity as a world religion.

114. Ancient Greek and Roman Religion

Pagan religious culture in the Classical Mediterranean world. Consideration of the differing religious attitudes and expectations of polytheisms and monotheisms, and of religious expression in the context of cult and ritual. (Also listed as Classics 185.)

115. Western Barbarians, 500–1100

The barbarians of Western Europe from their first appearance on the borders of the Roman Empire to their eventual civilization.

116. Crusading Age, 1000–1450

Europe from its revival in the eleventh century to the dissolution of the medieval world in the fifteenth century.

117. Renaissance and Reformation: Europe, 1350–1610

Main developments of the era beginning with the autumn of the Middle Ages. Italian Renaissance; formation of the early modern state, dynastic struggles and

the Ottoman menace; European overseas discoveries and expansion; Protestant Reformation and Catholic response; and religious rebellion and wars. Attention to cultural, artistic, and intellectual developments.

118. The Age of Louis XIV: Europe, 1610–1789

Study of an age of great artistic and unprecedented scientific achievement and its variety: the refinement of government, the waging of war, advances in thought, changing tastes in art, the life of the Old Regime before the coming of the revolution.

119. Special Topics in Medieval and Early Modern Europe

Occasional lecture courses in selected topics in medieval and early modern Europe.

124. Women in Europe‡

Survey of the social relationship between the sexes. Daily lives of women in preindustrial and industrial society, attitudes toward women in Western thought, feminism, and nineteenth-century women's movements.

125. European Diplomatic History

Relations of major European powers since 1870. Emphasis on economic, political, and social forces that influenced these relations.

126. European Culture and Society

Brief introduction to European culture and civilization from the end of the Middle Ages to the beginning of the twentieth century. Chief emphasis on the relationships of cultural forms, in the sense of letters, the fine arts and music, and social developments.

128, 129. Germany

Social, economic, political, and cultural development of the German nation—128: Germany from the Reformation to 1848; 129: Germany from 1848 to the Third Reich.

130. Ireland

Irish history since the Reformation. Emphasis on conflict between the Protestant Ascendancy and the Catholic population. The modern division of Ireland.

131, 132. England

Growth of the English state and constitution. Continental ambitions of England during the Middle Ages. Tudors and the English reformation; constitutional struggle under the Stuart monarchs; development of modern English government emphasizing political reforms of the nineteenth century; Britain's role in the modern world.

135. Spain

Experience of the peoples of Spain from earliest times to the present. Chief emphasis on period from Ferdinand and Isabella to the late seventeenth century (the *Siglo de Oro*) and to the crises of twentieth-century Spain.

136, 137. Russia

Political, social, and religious formation of early Russia; the reforms of Peter the Great; Russian absolutism and the impact of Western Europe in the eighteenth and nineteenth centuries; Russian Revolution; economic and political developments in the Soviet Union.

139. Special Topics in Modern Europe

Occasional lecture courses in selected topics in Modern Europe.

192. Seminar in Ancient, Medieval, or Early Modern Europe

Historical seminars. Emphasis on original research and group discussions of selected problems and periods. *Prerequisite: History 100.*

‡Course included in Women's Studies program

193. Seminar in Modern Europe

Historical seminars. Emphasis on original research and group discussions of selected problems and periods. *Prerequisite: History 100.*

198. Practicum

199. Directed Reading/Directed Research

Directed reading and research in source materials and secondary works dealing with selected historical problems in European history. Only with permission of dean, department chair, and instructor.

AFRICAN HISTORY

145. Introduction to African History and Cultures

Historical survey of the origins and development of African cultures from ancient times to the onset of European colonialism in the nineteenth century. Focus on selected civilizations and societies. Patterns of African social, economic, and political life.

140. Origins and Development of Islam

Prophethood of Muhammed and the Muslim revolution. Islamic conquests and formation of Muslim institutions. Development of philosophy, law, and art during the "golden age" of Islam. Fragmentation of the Muslim empire; the rise of Turkish power; the Crusades.

141. Modern Middle East and North Africa

European imperialism and the development of Arab nationalism. Problems of economic development, political stability, and military conflict.

144. Women in Islamic and African Societies‡

Comparative analysis of the legal position of women and their social, economic, and political roles in different African and Middle Eastern cultural settings.

146. Colonial Africa

Topics in African history. African institutions and culture in the imperial era, the rise of nationalism, the effects of social and economic change within the colonial situation.

147. Independent Africa

Topics in African history. African economic, social, and political problems after independence. Major ideologies and international conflict.

148. Southern Africa

Economic, social, and political history of the peoples of southern Africa. Emphasis on African initiative and resistance to white encroachment and the rise of Afrikaner nationalism.

149. Special Topics in African History

Occasional lecture courses in special topics in African history.

194. Seminar in African History

Historical seminars. Emphasis on original research and group discussion of selected problems and periods. *Prerequisite: History 100.*

198. Practicum

199. Directed Reading/Directed Research

Directed reading and research in source materials and secondary works dealing with selected historical problems in African history. Only with permission of dean, department chair, and instructor.

‡Course included in Women's Studies program

ASIAN HISTORY

51. Introduction to Chinese Civilization

Chinese history and culture from the dawn of civilization to the post-Maoist present. Ancient philosophies. Confucianism, traditional political institutions, the use of urbanization, the impact of the West, twentieth-century reform and revolution. Modern society, politics, and economics.

52. Introduction to Japanese Civilization

Two thousand years of Japanese history and culture. Age of classical civilization, the rise of feudalism and shogunal government, nineteenth-century modernization, imperialism, and war in the twentieth century. Postwar successes in social change and economic growth.

151. Premodern China

Chinese civilization from the earliest times to the Western intrusion. Dominant historical and cultural patterns; evolution of Confucianism, Taoism, and Buddhism; development of political institutions; analysis of pre-industrial economic experience; state-society relations.

152. Modern China

Analysis of nineteenth- and twentieth-century revolutionary changes. Equal emphasis on the disintegration of the old society in the last century of imperial rule and the efforts of twentieth-century revolutionaries to reintegrate and rebuild China. Intellectual and cultural changes and the roles of the West. Indigenous forces shaping China's modern evolution.

154. Women in Asia‡

Gender as a historical category in analyzing the impact of change in East Asia from the traditional to the modern period. Changing roles and status of women under industrialization, intellectual development, and legal reform.

155. Imperialism in East Asia

Social, political, and economic effects of imperialism in China, Korea, and Vietnam in the nineteenth and twentieth centuries; theories of colonialism and dependency and their application to East Asia.

156. Traditional and Early Modern Japan

Japan from prehistoric times to the mid-nineteenth century. Japan's adaptation of Chinese civilization; cultural and literary history; political effects of socioeconomic changes from the classical period through feudalism to the eve of Japan's interaction with the West; ideological developments and response to Western encroachment.

157. Modern Japan

Major themes in Japanese modern history since 1868. Japan's nineteenth-century "economic miracle"; problems faced by a rapidly modernizing agrarian economy; nationalism and imperialism and their effects on foreign policy; adaptation of Western ideals and institutions; social and political movements in the twentieth century, especially the suffrage and labor movements; postwar reconstruction.

158. Modern U.S.-Japan Relations

United States and Japan, from war through occupation. Diplomatic relations from the 1930s to the San Francisco Peace Treaty (1951), the content of America's postwar military occupation of Japan, and Japanese society under strains of both the war and an occupied peace.

‡Course included in Women's Studies program

159. Special Topics in Asian History

Occasional lecture courses in special topics in Asian history.

195. Seminar in Asian History

Historical seminars. Emphasis on original research and group discussion of selected problems and periods. *Prerequisite: History 100.*

198. Practicum

199. Directed Reading/Directed Research

Directed reading and research in source materials and secondary works dealing with selected historical problems in Asian history. Only with permission of dean, department chair, and instructor.

LATIN AMERICAN HISTORY

61. Latin America: Indians and Conquerors

Introduction to Latin American culture and civilization from the Native American empires, through the Iberian conquest, to the independence of Latin American nations.

62. Modern Latin America

Introduction to Latin American history focusing on the formation of nineteenth-century nations and the forces shaping their twentieth-century experience.

64. Central America

Survey of Central America from independence to the present. Focus on three Central American countries: Nicaragua, Guatemala, and El Salvador. Emphasis on recent developments; social, economic, and political problems (militarism, dictatorship); and the nature of U.S. policy vis-à-vis Central America.

161. Mexico: Colonial and Early National Periods.

Mexico from the Mayas and Aztecs to the Benito Juarez era in the 1870s. Examination of the Indian past, the Spanish conquest, and independence to Juarez's La Reforma.

162. Modern Mexico

Mexico since the Benito Juarez regime to the present. Emphasis on the Porfiriato, the 1910 Revolution and its institutionalization, and the development of the modern state.

163. Contemporary Latin America

A thematic introduction of the political and economic dynamics shaping twentieth-century Latin America. Political and economic dynamism, revolution, authoritarianism, popular aspirations, and current trends and prospects.

165. Argentina

The political and economic development of this southern South American nation from the late eighteenth century to the present, with emphasis on nineteenth-century gaucho leaders and liberalism, and also on twentieth-century democracy, militarism, and Peronism.

166. Cuba and the Caribbean

A survey of three Caribbean nations, Cuba, the Dominican Republic, and Puerto Rico, from the colonial period to the present. Emphasis on twentieth-century developments; social, economic, and political issues (dictatorship, revolution, social stratification); and the role of U.S. policy vis-à-vis Cuba and the Caribbean.

167. Brazil

Analytical study of Brazil's past and present: the colonial era, the New World monarchies of Pedro I and II, and the republic. Emphasis on social and economic developments.

168. U.S. and Latin American Relations

Analysis of the political, economic, and social relations between the United States and Latin America. Case studies of major

issues and events involving U.S. policy in Latin America. Emphasis on twentieth-century and recent developments.

169. Special Topics in Latin American History

Occasional lecture courses in special topics in Latin American history.

196. Seminar in Latin American History

Historical seminars. Emphasis on original research and group discussion of selected problems and periods. *Prerequisite: History 100.*

198. Practicum

199. Directed Reading/Directed Research

Directed reading and research in source materials and secondary works dealing with selected historical problems in Latin American history. Only with permission of dean, department chair, and instructor.

COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF MATHEMATICS

Professors: Gerald L. Alexanderson *(Chair),* Karel L. de Bouvere, S.C.J., Vladimir Drobot, Paul R. Halmos
Associate Professors: Frank A. Farris, Leonard F. Klosinski, David E. Logothetti, Dennis C. Smolarski, S.J.
Assistant Professors: Jose Barria, Fred Hickling, Alan Evan Wessel
Senior Lecturer: Jean J. Pedersen
Lecturers: Alice J. Kelly, Peter Ross
Michael and Elizabeth Valeriote Professor: Gerald L. Alexanderson

The Department of Mathematics offers major programs leading to the Bachelor of Science in Mathematics or the Bachelor of Science in Computer Science (Mathematics), as well as required and elective courses for students majoring in other fields. Either major may be pursued with any of three principal goals: preparation for graduate studies leading to advanced degrees in mathematics, computer science, statistics, operations research, or other fields; preparation for secondary school teaching of mathematics or computer science; or preparation for a career in research in industry or government. The major in mathematics may be taken with emphasis in computer science or in mathematical economics. Minors in mathematics or computer science are also available.

Graduate work is offered in the department for the Master of Science in the Teaching of Mathematics degree; for a description of this degree, see the *Counseling Psychology and Education Graduate Programs* bulletin. For a description of the Master of Science in Applied Mathematics degree offered by the School of Engineering, see the *School of Engineering Graduate Programs* bulletin.

REQUIREMENTS FOR MAJOR

Bachelor of Science Degree in Mathematics

In addition to completing the University and College requirements for the Bachelor of Science degree (pages 33–34), candidates for the B.S. in Mathematics must complete the following requirements:

1. Mathematics 11, 12, 13, 21, 52, and 53
2. Seven upper-division courses in mathematics, two of which must be Mathematics 102 and either 111 or 176 (or both). Mathematics 111 should be taken by students planning to do graduate work in mathematics; 176 is more suitable for students planning work in computer science or other applied areas. Students planning to undertake graduate studies in mathematics should plan to take, in addition to 102 and 111, Mathematics 105, 112, 113, 144, and 154.
3. Mathematics majors must demonstrate the ability to read a mathematical work in French, German, or Russian prior to graduation.
4. Physics 4 and 5. Students with a special interest in the application of mathematics in the social sciences or economics may substitute Economics 170, 171, or 177 for Physics 5. Students planning to teach in secondary schools may substitute, with approval of the department chair, Physics 104 and 105 for Physics 4 and 5.

Students electing the B.S. in Mathematics with emphasis in Computer Science should take Mathematics 10 and 61, Electrical Engineering and Computer Science 22, and at least four of the following: Mathematics 122, 123, 144, 154, 161, 162, 163, 164, 165, 166, 167, 168, 169, 176, 177. Mathematics 22 and 32 are recommended.

Bachelor of Science Degree in Computer Science (Mathematics)

In addition to completing University and College requirements for the Bachelor of Science degree (pages 33–34), candidates for the B.S. in Computer Science (Mathematics) must complete the following courses:

1. Mathematics 10, 11, 12, 13, 21, 22, 32, 52, 53, 61, and 163
2. One course chosen from Mathematics 161, 166, or 167
3. One upper-division mathematics course on the following list and two upper-division mathematics courses not on the list: Mathematics 144, 161, 162, 164, 165, 166, 167, 168, 169, 176, and 177
4. Physics 4 and 5
5. EECS 22 and 121 and one additional EECS upper-division course

EMPHASIS IN MATHEMATICAL ECONOMICS

The departments of Mathematics and Economics jointly offer a program providing an emphasis in mathematical economics. Students wishing to par-

ticipate major in either mathematics or economics but pursue a course of study that emphasizes the use of mathematics in the study of economics. Participation in the program is noted on the student's transcript. This program is especially suited for students planning graduate work or careers in mathematical economics, actuarial science, operations research, and related fields. All students in the program must complete the following in addition to University and College requirements as well as specific requirements in their major departments:

1. Economics 114, 115, 170, 171, and 177
2. Mathematics 21, 22, 52, 53, and 102
3. Mathematics 122, 123, or Economics 174

Full descriptions of the program may be obtained from the chairs of the Department of Economics or Mathematics.

EMPHASIS IN SIGNAL PROCESSING

The Department of Mathematics offers a program that provides a mathematics or computer science (mathematics) major with an emphasis in signal processing. This program is advantageous to students who are planning graduate work or careers related to signal or image processing. It provides the student with a strong theoretical background in areas related to digital signal or image processing, and completion of the program is noted on the student's transcript. In addition to University, College, and departmental requirements, students in this program need to complete the following:

1. Mathematics 10, 22, 105, 122, and 196 (special topics in mathematical signal processing, including a project or practicum)
2. Electrical Engineering and Computer Science 100, 110, 133, and 141
3. Physics 6 and 70

TEACHING CREDENTIAL PROGRAM

Students planning a career in secondary school teaching must fulfill the requirements for the teaching credential. In addition to the requirements for the B.S. in Mathematics or the B.S. in Computer Science (Mathematics), they must complete the following courses:

1. English 178 (Argumentation)
2. Communication 20 (Public Speaking)
3. Education 198 (see Division of Counseling Psychology and Education)
4. Mathematics 10, 101, 111, 122, 123, 134, 172, 175, and 176

As noted above, Physics 104 and 105 may be substituted for Physics 4 and 5.

HONORS PROGRAM

The Department of Mathematics maintains a program for the discovery, encouragement, and development of mathematical talent among undergraduates. This program includes special sections, seminars, individual conferences, and directed study guided by selected faculty members. Students are also encouraged to participate actively in research projects directed by faculty.

LOWER-DIVISION COURSES

4. Mathematics for Elementary Teachers I

Problem-solving and logical thinking approach to whole numbers: their nature, counting, place value, computational operations, properties, and patterns. Intuitive two-dimensional geometry and measurement, especially metric. Does not fulfill the University Curriculum requirement. NCX†

5. Mathematics for Elementary Teachers II

Problem-solving and logical thinking approach to fractional numbers, integers, rational numbers and real numbers: their nature, computational operations, properties, and patterns. Intuitive three-dimensional geometry and measurement, especially metric. Functions, relations, and graphs. Does not fulfill the University Curriculum requirement. *Prerequisite: Math 4 recommended but not required.* NCX†

6. Finite Mathematics for Social Science

Introduction to finite mathematics with applications to the social sciences. Sets, logic, combinatorial problems, probability, vectors, and matrices.

7. Calculus for Social Science

Introduction to differential and integral calculus with applications to the social sciences. Mathematics 7 and Mathematics 11 cannot both be taken for credit.

8. Introduction to Statistics

Elementary topics in statistics chosen from descriptive statistics, probability, random variables and distributions, sampling, estimation, hypothesis testing, regression, and correlation. *Prerequisite: Math 6, 7, or 9 or equivalent.*

9. Precalculus

College algebra and trigonometry, for students who wish to take further work in mathematics. Permission to enroll must be obtained from the department chair. Does not fulfill the University Curriculum requirement. (2 units)

10. Introduction to Computer Science

Introduction to computer science and programming. Structured programming techniques using Pascal and FORTRAN, machine structure, elementary algorithms, and data structures. Primarily (but not exclusively) for majors in computer science, mathematics, and physical sciences. Mathematics 10 may not be taken for credit if student has already received credit for a course in Pascal or FORTRAN (e.g., EECS 4, DISC 30). *Prerequisite: Math 11 (may be taken concurrently).*

11. Calculus and Analytic Geometry I

Differentiation and applications, integration. Mathematics 7 and Mathematics 11 cannot both be taken for credit. *Prerequisite: four years of high school mathematics (including trigonometry) or satisfactory grade in Math 9.*

†Exempted from challenge

12. Calculus and Analytic Geometry II

Continuation of 11. Methods and applications of integration, transcendental functions. *Prerequisite: Math 11.*

13. Calculus and Analytic Geometry III

Polar coordinates, parametric equations, infinite series, determinants, vectors. *Prerequisite: Math 12.*

21. Calculus and Analytic Geometry IV

Vector functions, partial derivatives, multiple integrals, line integrals, Green's theorem. *Prerequisite: Math 13.*

22. Differential Equations

Use of series, numerical, and Laplace transform methods in solving differential equations. Applications. *Prerequisite: Math 21.*

32. Mathematical Logic

Informal and formal methods in elementary logic. Arithmetical representations of statement calculus. Boolean algebras of sets, statements, and electrical switches. For students in computer science and/or students planning to pursue further work in logic and foundations. Recommended for Mathematics 133.

41. The Nature of Mathematics

For liberal arts students. Topics chosen from the theory of numbers, combinatorics, geometry, and other suitable areas. Material will generally be presented in a historical setting that allows students to participate in the discovery and development of important mathematical ideas. Emphasis on problem solving and *doing* mathematics.

51. Discrete Mathematics

Relations and operations on sets, orderings, elementary combinatorial analysis, recursion, algebraic structures, graphs. (Also listed as EECS 79.)

52. Introduction to Abstract Algebra

Groups, homomorphisms, isomorphisms, quotient groups, fields, integral domains, and applications to number theory.

53. Linear Algebra

Vector spaces, linear transformations, algebra of matrices, eigenvalues and eigenvectors, and inner products. *Prerequisite: Math 13.*

61. Data Structures

Analysis of structures used for computer data storage (arrays, records, stacks, queues, linked lists, trees). Introduction to algorithms associated with various data types (sorting, searching, tree traversal, large integer arithmetic), and to general programming techniques (recursion, iteration). Math 61 and EECS 70 cannot both be taken for credit. *Prerequisite: Math 10.*

90. Lower-Division Seminars

Basic techniques of problem solving. Topics in algebra, geometry, and analysis.

UPPER-DIVISION COURSES

Note: Some upper-division courses that are suggested for computer science (mathematics) majors may presuppose the ability to write computer programs in some language, even though Mathematics 10 is not explicitly listed as a formal prerequisite. Some upper-division courses (e.g., 101, 111, 112, 113, 133, 134, 144, 153, 154, 155, 164, 165, 167, 168, 169, 172, 174, 175, and 177) are offered only in alternate years.

101. A Survey of Geometry

Topics from projective, advanced Euclidean, and non-Euclidean geometries.

102. Advanced Calculus

Vector calculus, functions of several variables, elliptic integrals, line integrals, uniform convergence, Stokes's theorem, and the divergence theorem.

105. Theory of Functions of a Complex Variable

Analytic functions. Cauchy integral theorems, power series, conformal mapping. Riemann surfaces.

111. Abstract Algebra I

Topics from the theory of groups. *Prerequisites: Math 52 and 53.*

112. Abstract Algebra II

Rings and ideals, algebraic extensions of fields, and the Galois theory. *Prerequisite: Math 111.*

113. Topology

Pertinent set theory. Topological spaces, continuous functions, product spaces. Separability and compactness. Metric spaces and metric topologies.

122. Probability and Statistics I

Kolmogorov's axioms; conditional probability; independence; random variables; discrete and continuous probability distributions; expectation; moment-generating functions; weak law of large numbers; central limit theorem. *Prerequisite: Math 21.*

123. Probability and Statistics II

Estimation and hypothesis testing. Maximum likelihood estimation, likelihood ratio tests, and sampling from the normal distribution. Applications. *Prerequisite: Math 122.*

133. Logic and Foundations

Deductive theories. Theories and models. Consistency, completeness, decidability. Theory of models. Cardinality of models. Some related topics of metamathematics and foundations. Open to upper-division science and mathematics students and to philosophy majors having sufficient logical background. *Prerequisite: Math 32 or equivalent.*

134. Set Theory

Naive set theory. Cardinal and ordinal arithmetic. Axiom of choice and continuum hypothesis. Axiomatic set theory.

144. Partial Differential Equations

Special topics in higher mathematics useful in applications to the physical sciences, such as special functions of mathematical physics. Fourier series, partial differential equations, and boundary value problems.

153. Intermediate Analysis I

Rigorous investigation of the real number system. Concepts of limit, continuity, differentiability of functions of one real variable, and theorems of differential and integral calculus. *Prerequisite: Math 102.*

154. Intermediate Analysis II

Continuation of Mathematics 153.

155. Ordinary Differential Equations

Existence and nature of solutions, oscillation theory, orthogonal functions, partial differential equations. *Prerequisite: Math 102.*

161. Theory of Automata and Languages I

Mathematical preliminaries. Formal systems; tabular and graphical representation of automata. Deterministic and nondeterministic finite automata; conversion. Parallel and serial decomposition. Turing machines and the halting problem. Finite transducers, acceptors, and generators. Theory of translations. *Prerequisities: Math 52 and 61 or equivalent.*

162. Theory of Automata and Languages II

Formal grammars; definitions and classifications. Classes of languages. Normal forms. Grammars as language generators and recognizers. Finite state machines. Pushdown automata. Unsolvability; the post-correspondence problem; Kleene hierarchy. LL and LR grammars; applications to recognition of context-free languages. *Prerequisite: Math 161.*

163. Theory of Algorithms

Preliminaries: measuring work done by algorithms. Nonnumerical algorithms: searching, sorting, graph spanning and traversal, string matching. Numerical topics: polynomial and matrix arithmetic. P and NP completeness. *Prerequisites: Math 51 or 52, and 61 or equivalent.* (Also listed as EECS 179.)

164. Computer Simulation

Techniques for generation of probability distributions. Computer models of queueing in inventory and scheduling. Simulation of economic systems. Monte Carlo methods for physical systems. NCX†

165. Linear Programming

Algebraic background. Transportation problem. General simplex methods. Linear programming and theory of games. Numerical methods.

166. Numerical Analysis

Numerical algorithms and techniques for solving mathematical problems. Linear systems, integration, approximation of functions, solution of nonlinear equations. Analysis of errors involved in the various methods. Direct methods and iterative methods. (The ability to program in some scientific language is assumed.)

167. Switching Theory and Boolean Algebra

Switching algebra and Boolean algebra. Minimization via Karnaugh maps and Quine-McCluskey, state compatability and equivalence. Machine minimization. Faults. State identification, finite memory, definiteness, information losslessness.

168. Computer Graphics

Systematic and comprehensive overview of interactive computer graphics such as mathematical techniques for picture transformations and curve and surface approximations. *Math 53 recommended but not required.*

169. Programming Languages

Comparative study of major classes of programming languages. Introduction to theoretical definitions of languages and run-time concerns, with emphasis on good points and deficiencies of various languages and on using the appropriate language for a given task. Programs written in several languages, e.g., FORTRAN, LISP, SNOBOL, COBOL, C, Path-Pascal.

170. Development of Mathematics

A selection of mathematical concepts with their historical context. *Prerequisite: upper-division standing in a science major.*

172. Problem Solving

Use of induction, analogy, and other techniques in solving mathematical problems.

174. Differential Geometry

Introduction to curves and surfaces. Differential forms, Frenet formulas, frame fields, and differentiation on surfaces. *Prerequisite: Math 53.*

175. Theory of Numbers

Fundamental theorems on divisibility, primes, congruences. Number theoretic

†Exempted from challenge

functions. Diophantine equations. Quadratic residues. Partitions.

176. Combinatorics

Permutations and combinations, generating functions, recursion relations, and a selection of topics from combinatorial geometry, graph enumeration, and Polya counting theorem.

177. Graph Theory

Selected topics from planarity, connectedness, trees (enumeration), digraphs, graph algorithms, and networks.

190. Upper-Division Seminars

Advanced topics in algebra, geometry, or analysis. Research projects.

196. Advanced Topics

Offered each year in an advanced area of mathematics not ordinarily covered in the regularly offered courses. Often an area of current interest.

199. Independent Study

Reading and investigation for superior students under the direction of a staff member. This can be used only to extend, not to duplicate, the content of other courses.

COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF MODERN LANGUAGES AND LITERATURES

Professors: Francisco Jiménez, Victor B. Vari
Associate Professors: Cedric U. Busette, Andrew I. Rematore, K-G Seely, Christian L. van den Berghe
Assistant Professors: Elena M. De Costa, Tonia C. Riviello
Senior Lecturer: Verónica González-Mena LoCoco
Lecturers: Rose Marie Beebe, Catherine R. Montfort, Gudrun Tabbert-Jones *(Chair)*
Phil and Bobbie Sanfilippo Professor: Francisco Jiménez
Harold and Edythe Toso Professor: Victor B. Vari

The Bachelor of Arts degree in French, German, Italian, or Spanish is designed to aid students in achieving proficiency in both the oral and written language. The program also aims at providing students with an understanding of the experiences, values, and traditions of those peoples whose languages are studied. Courses range from beginning language to linguistics, from an introduction to literary texts to advanced courses in literature and culture.

REQUIREMENTS FOR MAJOR

In addition to University and College requirements for the Bachelor of Arts degree (pages 31–33) and such lower-division courses as the individual candidate may need, each major must complete a minimum of 40 quarter units of work in upper-division courses in either French, German, Italian, or Spanish. Each major program requires completion of Language 100 and 101 or the equivalent as prerequisites to more advanced courses. All major programs must be approved by the student's faculty adviser. Academic minors are also available.

SINGLE-SUBJECT CREDENTIAL WAIVER PROGRAM

The state of California requires that all students seeking a credential to teach French, German, or Spanish in California public secondary schools, in addition to completing a fifth year of studies and student teaching, pass the National Teacher Examination or complete a state-approved program of studies in the subject. The California State Commission on Teacher Credentialing has approved programs for Santa Clara University in French, German, and Spanish. For the specific requirements, consult the introductory statements to the course listings in those languages.

HIGH SCHOOL CREDIT AND PLACEMENT

The Department of Modern Languages recommends the following formula for students who wish to continue a language studied in high school. Those who have had two years of language should enter Language 2; those with four years of language should enter Language 22; those with three years of language should consult the language faculty. Students whose language background is inadequate to permit following the above formula may be permitted to enter lower-numbered courses for credit after consultation with a member of the language faculty.

Students having the necessary proficiency, as demonstrated by an interview with a member of the language faculty, may enroll in higher-numbered courses than those of the placement formula. Once proficiency is established, lower-division students may enroll in upper-division courses with the permission of the instructor. Such courses will be counted as fulfilling major requirements.

COURSES EXEMPTED FROM CHALLENGE

Courses numbered 1 through 101 are not open to challenge.

MEDIA LABORATORY

Throughout lower-division courses, and in such upper-division work as the instructor may specify, students are required to use the facilities of the media laboratory to increase their language skills. Students may establish their own schedule of attendance.

CONVERSATION GROUPS

As an adjunct to intermediate and advanced courses, the department offers students the opportunity to participate in small conversation groups of five or six students, under the direction of a native speaker or an advanced major. Those interested in such activities should consult individual language teachers for further details.

FRENCH

(See general statement, page 105.)

Bachelor of Arts in French (French major)

The major program consists of a minimum of 40 quarter units of upper-division work in French, including French 185 (French Applied Linguistics) or its equivalent, as approved by the student's major adviser. Recommended electives include courses in French or European history, comparative literature, art history, and additional work in linguistics.

The French Waiver Program (for prospective teachers only)

Coordinator: Dr. Christian van den Berghe

Requirements

1. French 1, 2, 3, 21, and 22 (or equivalent)
2. 45 quarter units of upper-division French including:
   a. French 100, 101, 110, 111, and 185
   b. At least 20 quarter units in French literature (Two courses are recommended from course offerings on seventeenth-, nineteenth-, or twentieth-century literature.)
   Note: Although French 199 (Directed Reading) may be counted toward the French major, it does not fulfill any of the requirements *for this program.*
3. Two courses in European and/or French history
4. One course in history of art that includes a focus on French artists

Recommended Electives

1. French 106, 107, 172; Education 98/198.02; Psychology 187; English 101, 180
2. Although not required, experience or study abroad in Paris or Nantes (I.E.S.) is encouraged and recommended (see Studies Abroad, page 214).

Waiver program students are expected to maintain a 3.0 grade point average in the French major and a cumulative grade point average of 2.75. Each student's oral proficiency in the French language will be assessed by a designated member of the French faculty, regardless of the individual's grade point average or course work completed.

COURSE DESCRIPTIONS

1. Elementary French I

Development of skills in understanding, speaking, reading, and writing French. Language laboratory required.

2. Elementary French II

Continuation of French I.

3. Elementary French III

Completion of elementary French.

21. Intermediate French I

Review of spoken and written French. Readings in original prose. *Prerequisite: French 3 or equivalent.*

22. Intermediate French II

Continued review of the French language. Discussions of readings (short stories, novellas, and/or plays).

100. Advanced French I

Intensive grammar, speaking, and composition. Research projects and/or participation in theatricals. Required of all majors.

101. Advanced French II

Introduction to literary analysis in poetry, prose, and drama. Required of all majors. (May be taken concurrently with certain other upper-division courses.)

106. Advanced French Conversation

Intensive work stressing the single skill of French conversation in everyday situations. No auditors. *Prerequisite: French 22 or 100; permission of instructor in advance of registration.* NCX†

107. Contemporary French Media

Conversations based on current events in French-speaking countries. An analysis of French-language media (print, television, radio). No unofficial auditors. *Prerequisite: French 100 or 106.* NCX†

108. Business French

Basic French business terminology and practices. Business letter writing emphasized. Examination of French business institutions (agriculture, finance, advertising, transportation, etc.). Special emphasis on understanding the underlying cultural mores that make French business different from U.S. business.

110. Culture and Civilization I

Cultural, political, economic, artistic, educational, and social aspects of France.

111. Culture and Civilization II

Cultural, political, economic, educational, and social aspects of French-speaking societies outside of France: Belgium, Luxembourg, Monaco, Québec, Switzerland, French-speaking Africa, etc. Cross-cultural comparative approaches. May be taken independently from French 110.

120. Moyen Age

Epic, lyric, and courtly literature of medieval France: Roland, *l'amour courtois* and the Troubadours, Chrétien de Troyes, *Tristan et Iseut,* Artur, the early theatre.

130. Sixteenth Century

La Renaissance: readings in Rabelais, the Pléiade poets, and Montaigne.

140. Seventeenth Century

Le Grand Siècle: evolution of literary and philosophical currents. Emphasis on Corneille, Racine, Molière, La Fontaine, Descartes, Pascal, etc.

150. Eighteenth Century

Le Siècle des lumières: studies in the literature and thought of the Age of Enlightenment. Emphasis on Montesquieu, Voltaire, Diderot, and Rousseau.

160. Nineteenth Century I

Romantic literature: prose and poetry (Chateaubriand, Stendhal, Lamartine, Hugo, Balzac, Vigny, etc.).

161. Nineteenth Century II

Realist, Naturalist, and Symbolist literature (Baudelaire, Flaubert, Zola, Mallarmé, etc.).

170. Twentieth Century I

Writings of *la belle époque* and *entre deux guerres* (Proust, Gide, Apollinaire, Malraux, etc.).

†Exempted from challenge

171. Twentieth Century II

The *engagée* literature, the Anti-theatre, the New Novel, and current directions (Anouilh, Sartre, Camus, Ionesco, Robbe-Grillet, Tournier, etc.).

172. Cinéma

Origins and development of the art of film in France. Not a film-making course. Evolution of cinematic theory and technique as exemplified in the feature films of individual directors. Weekly screenings with discussions, analyses, and *travaux pratiques.* No unofficial auditors.

180. Seminars

Variable topics in culture, literature, and film. May be retaken for credit.

182. Women in French Literature: Authors and Characters‡

Outstanding French women writers from the Middle Ages to the present time (Marie de France, Madame de Lafayette, Georges Sand, Colette, Marguerite Duras, Simone de Beauvoir).

185. French Applied Linguistics

Aspects of modern French linguistics (phonology, phonetics, morphology, syntax). Contrastive analysis. Required of all majors and all prospective teachers of French.

199. Directed Reading

Individually designed programs of advanced readings. Written permission of the instructor, department chair, and dean required in advance of registration.

‡Course included in Women's Studies program

GERMAN

(See general statement, page 105.)

Bachelor of Arts in German (German major)

The major program consists of 40 quarter units of upper-division work in German. All major programs must be approved by the student's faculty adviser. Recommended elective courses include English 101 (Linguistics), English 102 (Theories of Modern Grammar), and History 128 or 129 (Germany).

The German Waiver Program (for prospective teachers only)

Requirements

1. German 1, 2, 3 or 5, 21, and 22 (or equivalent)
2. 45 quarter units of upper-division German including:
   a. German 100, 101, 110 or 111, and 175
   b. At least 20 quarter units in German literature
   c. German 199 (may be taken only once to satisfy a waiver program requirement)
3. Two courses in European and/or German history
4. One course in either history of the English language, English linguistics, or modern English grammar

Recommended Electives

1. Education 98/198.02; Education 119; Psychology 187; English 180; European art history; English, American, or comparative literature
2. Although not required, experience or study abroad in Freiburg, Germany, or Vienna, Austria (I.E.S.), is encouraged and recommended (see Studies Abroad, page 214).

Waiver program students are expected to maintain a 3.0 grade point average in the German major and a cumulative grade point average of 2.75. Each student's proficiency in the German language will be assessed by designated members of the German faculty to determine any need for further language training.

COURSE DESCRIPTIONS

1. Elementary German I

Development of skills in understanding, speaking, reading, and writing modern German. Cultural information on the German-speaking countries. Language laboratory required.

2. Elementary German II

Continuation of German 1.

3. Elementary German III

Completion of elementary German.

5. German for Reading Knowledge

Alternate to German 3 leading to the reading of scholarly articles partially in the student's particular field of study. *Prerequisite: German 2 or equivalent.*

21. Intermediate German I

Systematic review of German grammar, short stories, or essays on culture and civilization. Progressive exercises in conversation.

22. Intermediate German II

Continuation of German 21. Accelerated readings, conversation, and writing.

100. Advanced German I

Advanced reading, composition, and conversation. Emphasis on conversation and career-oriented language. Required of all majors.

101. Advanced German II

Reading of literary texts, composition, and discussion. Required of all majors. Completion or equivalent knowledge admits students to higher-numbered courses.

110. History of German Civilization

Cultural history of the German-speaking countries from earliest times to 1945.

111. Contemporary German Civilization

Geography, culture, education, politics, and the economy in the German-speaking countries since 1945.

130. The Classical Age

Major works by Goethe and Schiller.

140. Nineteenth-Century Romanticism

Philosophy of the Romantics. German fairy tale. Selected works by Kleist, Eichendorff, Heine, and Wagner.

141. Nineteenth-Century Realism

Works by Büchner, Hebbel, Fontane, Marx, and Hauptmann.

150. Twentieth-Century Novel‡

Works by Kafka, Hesse, Thomas Mann, Christa Wolf, Böll, and others.

‡Course included in Women's Studies program

151. Twentieth-Century Drama

Plays by Brecht, Borchert, Frisch, and Dürrenmatt and Brecht's theoretical writings.

160. The German Novelle

Characteristic features of the *Novelle* as opposed to *Roman* and *Erzählung.* Examples from Theodor Storm to Thomas Mann.

161. Survey of Lyric Poetry

Introduction to the analysis of poetry. Numerous examples from all German literary periods beginning with 1600.

175. German Applied Linguistics

Modern German linguistics. Emphasis on phonology, phonetics, and contrastive analysis of German and English.

180. Special Topics

Variable topics in culture and literature. May be retaken for credit.

199. Directed Reading

Individually designed programs of advanced readings. Written permission of the instructor, department chair, and dean is required in advance of registration.

Literature in Translation

115. German Literature in English Translation

Reading and analysis of masterpieces of German literature written between 1750 and 1970. Selection dependent upon available translations.

Note: Courses in literature in translation cannot be used to fulfill the foreign-language requirement.

ITALIAN

(See general statement, page 105.)

Bachelor of Arts in Italian (Italian major)

The major program includes a minimum of 40 quarter units of upper-division work in Italian. All major programs must be approved by the student's faculty adviser. Recommended electives include courses in mythology, comparative literature, and Renaissance history.

COURSE DESCRIPTIONS

1. Elementary Italian I

Development of skills in understanding, speaking, reading, and writing modern Italian. Language laboratory required.

2. Elementary Italian II

Continuation of Italian 1.

3. Elementary Italian III

Completion of elementary Italian.

21. Intermediate Italian I

Review of fundamentals of spoken and written Italian. Progressive readings reflecting Italian culture and values. Progressive exercises in conversation and composition. *Prerequisite: Italian 3 or equivalent.*

22. Intermediate Italian II

Continuation of Italian 21.

100. Advanced Italian I

Composition, reading, and conversation. Required of all majors.

101. Advanced Italian II

Continuation of Italian 100. Required of all majors.

110. Italian Civilization I

Fundamental aspects of Italian history, art, and culture from their origins to the *seicento.*

111. Italian Civilization II

Continuation of Italian 110. May be taken independently. From the *settecento* to the present.

112. Survey of Italian Culture and Civilization

Highlights of Italian history, geography, art, music, and culture from their origins to the present. Summer course, offered *only* in Assisi, Italy.

120. Survey of Italian Literature I

From its origin to the *seicento.*

121. Survey of Italian Literature II

From the *settecento* to the present.

130. Dante, La Divina Commedia I

Inferno and *Purgatorio.*

131. Dante, La Divina Commedia II

Purgatorio and *Paradiso.*

140. Duecento, Trecento

Emphasis on Dante's minor works. Petrarch's poetry, and Boccaccio's *Decameron.*

150. Quattrocento, Cinquecento (Rinascimento)

Important trends in the literary masterpieces of the Renaissance. Significant works of Ariosto, Tasso, Leonardo, Machiavelli, Lorenzo de Medici, Poliziano, Castiglione.

160. Settecento

Salient works of Vico, Goldoni, Parini, and Alfieri.

170. Ottocento, I Promessi Sposi

The works of Foscolo, Leopardi, Manzoni's poetry. Carducci, Pascoli, and Verga will be discussed.

180. Novecento

Italian literature of the twentieth century. Main trends in poetry, drama, and the novel from Pirandello to the present.

182. Twentieth-Century Italian Women Writers‡

Critical analysis of major works by leading women writers in Italy today: Grazia Deledda, Sibilla Serao, Elsa Morante, Natalia Ginzburg, Oriana Fallaci, Maria Bellonci, Giuliana Morandini, Dacia Maraini, Laudomia Bonanni, Lalla Romano.

199. Directed Reading

Individually designed programs of advanced readings. Written permission of the instructor, department chair, and dean required in advance of registration.

‡Course included in Women's Studies program

JAPANESE

COURSE DESCRIPTIONS

1. Elementary Japanese I

Development of skills in understanding, speaking, and reading modern Japanese. Language laboratory required.

2. Elementary Japanese II

Continuation of Japanese 1. Introduction to writing in *Kana* syllables and in *Kanji* (Japanese characters).

3. Elementary Japanese III

Completion of elementary Japanese.

21. Intermediate Japanese I

Review of spoken and written Japanese. Advanced exercises in conversation and composition. *Prerequisite: Japanese 3 or equivalent.*

22. Intermediate Japanese II

Continuation of Japanese 21.

100. Advanced Japanese I

Composition, conversation, grammar, and writing. *Prerequisite: Japanese 22 or equivalent.*

101. Advanced Japanese II

Continuation of Japanese 100. *Prerequisite: Japanese 100 or equivalent.*

102. Advanced Japanese III

Continuation of Japanese 101. *Prerequisite: Japanese 101 or equivalent.*

SPANISH

(See general statement, page 105.)

Bachelor of Arts in Spanish (Spanish major)

The major program consists of a minimum of 40 quarter units of upper-division work in Spanish, including Spanish 100 and 101 (Advanced Spanish I and II) or equivalent, and Spanish 175 (Spanish Applied Linguistics I). Majors may choose to concentrate in the Latin American or Spanish Peninsular area, but must take courses in both fields. All major programs must be approved by the student's faculty adviser. Courses in the history of Latin America and Spain are recommended.

The Spanish Waiver Program (for prospective teachers only)

Coordinator: Dr. Verónica LoCoco

Requirements

1. Spanish 1 or 11, 2 or 12, 3, 21, and 22 (or equivalent)
2. 45 quarter units of upper-division Spanish including:
   a. Spanish 100, 101, 133, 175, and 176
   b. At least 20 quarter units in Spanish language, literature, or culture, including some work in both Latin American and Peninsular literature and culture

   c. Spanish 199 (may be taken only once to satisfy a waiver program requirement)
3. Two courses in the history and culture of Hispanic civilization
4. One course in the history of art that includes Hispanic artists

Recommended Electives

1. Spanish 50, Education 98/198.02, Psychology 187, English 180
2. Although not required, experience or study abroad is encouraged and recommended (see Studies Abroad, page 214).

Waiver program students are expected to maintain a 3.0 grade point average in the Spanish major and a cumulative grade point average of at least 2.75. Prior to the senior year (or at the point of entry into the program if during the senior year), each student's proficiency in the writing of English and the writing and speaking of Spanish will be assessed by two or more designated members of the Spanish faculty to determine any need for further study in these areas.

COURSE DESCRIPTIONS

1. Elementary Spanish I

Designed for those having no previous study of Spanish. Development of skills in understanding, speaking, reading, and writing modern Spanish, in that order. Development of an understanding of Hispanic culture. Daily language laboratory required.

2. Elementary Spanish II

Continuation of Spanish 1.

3. Elementary Sanish III

Completion of elementary Spanish.

11. Review of Elementary Spanish I

Designed for those who have had previous study of Spanish, but who have been away from the language for a while, and need a review before enrolling in Spanish 2 or higher-numbered courses. Covers the same material as Spanish 1 but in half the class time. *Prerequisite: one or two years of high school Spanish or equivalent.* Not open to those having college credit in Spanish. (2 units)

12. Review of Elementary Spanish II

For those who have had previous study of Spanish. Covers the same material as Spanish 2 but in half the class time. *Prerequisite: two years of high school Spanish, Spanish 11, or Spanish 1.* (2 units)

21. Intermediate Spanish I

Review of fundamentals of spoken and written Spanish. Progressive readings reflecting Hispanic culture and values. Progressive exercises in conversation and composition. *Prerequisite: Spanish 3 or three years of high school Spanish.*

22. Intermediate Spanish II

Systematic development of skills in understanding, speaking, reading, and writing modern Spanish. Thorough coverage of Spanish grammar, which is continued in Spanish 100 and 101. Broadening awareness of Hispanic culture and values is developed together with discussion of literary works. *Prerequisite: Spanish 21 or four years of high school Spanish.*

50. Spanish Conversation

Intensive work stressing the single skill of Spanish conversation in everyday situations. *Prerequisite: Spanish 22 or equivalent and permission of the instructor.*

100. Advanced Spanish I

Composition, conversation, and grammar. Introduction to literary analysis. Required of all majors. *Prerequisite: Spanish 22.*

101. Advanced Spanish II

Continuation of Spanish 100. Required of all majors.

Note: Completion of Spanish 100 and 101, or evidence of equivalent preparation, will admit students to higher-numbered courses.

103. Spanish Grammar and Composition

Intensive work in Spanish grammar and composition. Diagnostic-prescriptive approach based on analysis of the writing problems of enrolled students. *Prerequisite: Spanish 101 or equivalent, and permission of the instructor.* NCX†

110. Advanced Spanish Conversation

Advanced work stressing the development of self-expression in Spanish. *Prerequisite: Spanish 101 or equivalent and permission of the instructor.* NCX†

112. Mexican Culture

Mexican literature, fine arts, history, and social developments, with particular attention to cultural values.

120. Major Works of Spanish Literature I

Readings in Spanish literature from the beginnings to the end of the seventeenth century.

121. Major Works of Spanish Literature II

Readings in Spanish literature of the eighteenth and nineteenth centuries. Continuation of Spanish 120. May be taken separately.

125. Colloquium: Spanish Literature and Culture

Topic will vary. Study and discussion of selected themes in Spanish Peninsular literature and culture. May be retaken for credit. NCX†

126. Spanish Culture and Civilization

A survey of the history, geography, art, architecture, literature, music, and religion of Spain from prehistoric times through the 18th century.

130. Survey of Latin American Literature and Culture I

Latin American literature, fine arts, history, and social developments from the pre-Columbian period to 1888.

131. Survey of Latin American Literature and Culture II

Latin American literature, fine arts, history, and social developments from 1888 to present.

133. Mexican American Literature§

Reading, analysis, and discussion of Mexican American literature. Emphasis on the novel and short story.

135. Colloquium: Latin American Literature and Culture

Topic will vary. Reading and discussion of selected themes in Latin American literature and culture. May be retaken for credit. NCX†

140. Modern Latin American Literature I

Reading, analysis, and discussion of the works of major Latin American writers of the late nineteenth and early twentieth centuries, e.g., Gallegos, Güiraldes, Barrios, Prado, and Romero.

†Exempted from challenge §Course included in Ethnic Studies program

141. Modern Latin American Literature II

Reading, analysis, and discussion of the works of major Latin American writers of the late nineteenth and early twentieth centuries. Emphasis on the novel.

145. Contemporary Latin American Literature I

Reading, analysis, and discussion of the works of major Latin American writers from 1946 to the present. Asturias, Carpentier, Yáñez, Fuentes, and others.

146. Contemporary Latin American Literature II

Reading, analysis, and discussion of the works of major Latin American writers of the present. Mallea, García Márquez, Vargas Llosa, Rulfo, and others.

150. Twentieth-Century Spanish Literature I

Major writers of Spain from 1898 to 1936. Particular emphasis on the Generation of 1898.

151. Twentieth-Century Spanish Literature II

Major writers of Spain from 1936 to the present.

165. Cervantes: Don Quijote

Cervantes' masterpiece, as a reflection of Spanish society during the Spanish Empire, an exemplar of Baroque art and a synthesis and culmination of narrative prose.

175. Spanish Applied Linguistics I

Introduction to the study of applied linguistics. Detailed scientific analysis of the phonology of modern Spanish. Contrastive analysis of Spanish and English sound systems. Required of all majors and of all prospective teachers of Spanish.

176. Spanish Applied Linguistics II

Detailed scientific analysis of the morphology and syntax of modern Spanish. Contrastive analysis within the Spanish structure system and between the Spanish and English structure systems. *Prerequisite: Spanish 175.* Required of all prospective teachers of Spanish.

199. Directed Readings in Spanish

Individually designed programs of advanced readings. Written permission of the instructor, department chair, and dean is required in advance of registration.

Literature in Translation

115. Twentieth-Century Mexican Literature in Translation

Reading, analysis, and discussion of outstanding works by modern and contemporary Mexican writers. Emphasis on the novel.

117. Latin American Literature in Translation

Reading, analysis, and discussion of works of leading Latin American writers. Emphasis on contemporary novelists of South America.

Note: Courses in literature in translation cannot be used as credit toward a Spanish major, minor, or foreign-language requirement.

COLLEGE OF ARTS AND SCIENCES MULTIDISCIPLINARY STUDIES

The program in Multidisciplinary Studies has been established to meet the needs of students who wish to design a course of studies with a multidisciplinary perspective.

The coordinator of the Multidisciplinary Studies program is Dr. Witold Krassowski, Department of Anthropology and Sociology.

REQUIREMENTS FOR MAJOR

Students who wish to be admitted to the program as a candidate for the Bachelor of Arts or Bachelor of Science degree in Multidisciplinary Studies must

1. be a full-time student at Santa Clara for at least one year;
2. have fewer than 111 quarter units of academic work completed at the time of application;
3. have a minimum 3.0 grade point average;
4. submit a Petition for Admission to the program coordinator for review and approval.

The student petition should include

1. a clear, logical, and concise statement of educational objectives;
2. a well-developed argument, supported by appropriate evidence, showing that no existing academic major can meet the student's educational objectives;
3. a plan of study by academic quarter, listing courses, seminars, internships, etc., which corresponds to the student's educational objectives and fulfills the requirements of the University Curriculum.

MULTIDISCIPLINARY STUDIES/PRE-TEACHING

Multidisciplinary Studies/Pre-Teaching is designed for students interested in a career in elementary school teaching. This program is approved by the California State Commission on Teacher Credentialing as a waiver from the state subject matter examination for the Multiple-Subject Credential. In order to qualify for a Multiple-Subject Teaching Credential, students must complete the requirements of Multidisciplinary Studies/Pre-Teaching and a program in professional education, including student teaching. Professional education is offered by the Division of Counseling Psychology and Education.

Multidisciplinary Studies/Pre-Teaching consists of at least 136 quarter units divided equally among four broad areas: (1) English and communications, (2) mathematics and sciences, (3) social sciences, and (4) humanities and fine arts. The schedule of specific requirements can be obtained from the coordinator of Multidisciplinary Studies/Pre-Teaching, Dr. Rose Marie Beebe, Department of Modern Languages and Literatures.

COURSES IN MULTIDISCIPLINARY STUDIES

The College of Arts and Sciences may offer multidisciplinary courses. Offered by the College rather than by any single department, these courses often

combine several academic disciplines (e.g., literature, philosophy, and religious studies) and are suitable as electives. They are designed to integrate several approaches to a single theme or topic. Open to all students of the University unless otherwise specified, these courses are especially suited to nonmajors who have a limited number of electives. One such course, for example, is offered each year.

COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF MUSIC

Professor: Roger T. Nyquist
Associate Professors: Hans C. Boepple, Lynn R. Shurtleff *(Chair)*
Assistant Professor: Nancy Wait Kromm
Acting Assistant Professor: Gene D. Biringer
Frank Sinatra Professor: Henry Mollicone

The Music Department offers major programs leading to a Bachelor of Arts degree or to a Bachelor of Music degree. The Bachelor of Arts degree is intended for those students desiring a liberal education with a music major. The Bachelor of Music degree is intended for students of high performance capability who are preparing for careers as performers.

In addition to courses designed for music majors, the department offers general courses of interest and cultural value to all University students who wish to become either trained performers or appreciative listeners. An academic minor is also available.

The Music Department is a member of the National Association of Schools of Music.

REQUIREMENTS FOR MAJOR

Bachelor of Arts with a Major in Music

A student working toward a Bachelor of Arts degree in music, in addition to completing the University and College requirements, must earn a minimum of 58 quarter units of credit in the department. The following courses must be included:

1. Music 21, 22, 23, 51.01, 51.02, 52.01, 52.02, 53.01, 53.02 54.01, 54.02, 55.01, 55.02, 56.01, 56.02, 69, 124, 125, 158, and 165
2. One course in the life of a composer

Music majors must also pass proficiency exams in sight-singing and piano, which are administered during the freshman and sophomore years. Students are expected to perform in an ensemble during each quarter that they are in residence, and they must meet minimum departmental standards in concert attendance quarterly. They are also expected to receive private instruction in their area of specialty every quarter. Failure to complete piano and sight-

singing proficiencies by the end of the sophomore year may result in ineligibility to register for upper-division music courses.

Bachelor of Music Degree

Entrance into the Bachelor of Music degree program takes place at the end of the sophomore year of study. To be accepted into the program the student must successfully pass the Sophomore Hearing. This hearing consists of 30 minutes of music prepared to performance quality that is presented in a closed recital to the music faculty.

After acceptance to the degree program, the following requirements must be completed:

1. A total of at least 114 credits in music
2. All requirements for the Bachelor of Arts degree
3. At least five electives from departments outside the major
4. Additional courses according to the area of specialty:
   a. Conducting Students
      Music 134 and three courses chosen from Music 130, 135, 139, 140, 142
   b. Composition Students
      Music 156 and 159 and three courses chosen from Music 134, 135, 139, 140, 142
   c. Instrumental Students
      Music 134 and three courses chosen from Music 135, 139, 140, 142
   d. Organ Students
      Music 127 and 134 and two courses chosen from Music 135, 139, 140, 142, 155
   e. Piano Students
      Music 128 and 134 and two courses chosen from Music 135, 139, 140, 142, 155
   f. Voice Students
      Music 129, 166, 179, 180, 181
5. Presentation of a Junior Recital (except Composition Students)
6. Presentation of a Senior Recital, or, for Composition Students, a Senior Project

PERFORMER'S CERTIFICATE

The faculty of the Music Department occasionally awards the Performer's Certificate, giving special recognition to excellence in musicality and technical proficiency as demonstrated through performance. All regularly enrolled University students are eligible. Details concerning procedures for awarding the Performer's Certificate are available in the Music Department office.

NATIONAL CHORAL STUDENT AWARD

The American Choral Directors' Association and the Department of Music provide a national award that can be given to an outstanding choral singer enrolled in the University. Continuous participation for two years in a departmental ensemble is a primary requirement. Additional criteria are available from the Department of Music.

APPLIED MUSIC

Private Instruction

Private instruction is available in applied music. One unit of credit is given per quarter. Upper-division students pursuing the Bachelor of Music degree receive 3 units of credit per quarter. (There is an extra fee for all Private Instruction 1 through 17 and 100 through 117 courses.) May be repeated for credit. Nine private lessons are given each quarter. Extensive individual practice is required. Open to nonmajors.

1/101. Organ

2/102. Harpsichord

3/103. Piano
Piano class must be taken as a prerequisite to private instruction for beginning students.

4/104. Voice

5.01/105.01 Strings/Violin

5.02/105.02 Strings/Viola

5.03/105.03 Strings/Violoncello

5.04/105.04. Strings/Contrabass

6.01/106.01. Brass/Trumpet

6.02/106.02. Brass/Trombone

6.03/106.03. Brass/Tuba

6.04/106.04. Brass/Horn

7.01/107.01. Woodwinds/Flute

7.02/107.02. Woodwinds/Oboe

7.03/107.03. Woodwinds/Clarinet

7.04/107.04. Woodwinds/Bassoon

7.05/107.05. Woodwinds/Saxophone

8/108. Percussion

9/109. Guitar

10/110. Vocal Coaching

11/111. Recording Engineering

14/114. Private Instruction in Electronic Composition

15/115. Private Instruction in Composition

16/116. Private Instruction in Conducting

17/117. Private Instruction in Theory or History

199.01. Junior Recital (45-minute recital)

199.02. Senior Recital (60-minute recital)

199.03. Senior Thesis for Theory, History, and Composition Emphasis

Comprehensive paper or composition approved by the faculty.

APPLIED MUSIC

Class Instruction

76. Beginning Piano Class

Classes limited to ten students. Instruction in rudiments of beginning and intermediate piano. May be repeated for credit. Open to nonmajors.

77. Beginning Guitar Class

Examination of essential elements required to play the guitar in the classical style, including fundamental principles of technique, sight-reading, pedagogic repertoire, history, and literature. Open to nonmajors.

78. Intermediate Classical Guitar

Continuation of 77. Increased emphasis on the upper positions, technique, repertoire, and interpretation. Open to nonmajors. *Prerequisite: Music 77.*

79. Beginning Voice Class

Application of basic vocal techniques to develop singing facility. Open to nonmajors.

80. Intermediate Voice Class

Continuation of 79. Open to nonmajors. *Prerequisite: Music 79 or permission of instructor.*

ENSEMBLE

Note: All ensemble courses are open to nonmajors and may be repeated for credit.

70/170. Jazz Ensemble

Open to selected students for preparation and performance of literature for stage and jazz ensembles. By audition only. (1 unit per quarter)

71/171. University Concert Choir

Open to selected students for preparation and performance in concert of works of the significant choral literature. By audition only. (1 unit per quarter)

72/172. Renaissance Singers

Open to selected students for preparation and performance in concert of works of the significant choral chamber literature. By audition only. (1 unit per quarter)

73/173. Women's Chorus

Preparation and performance of vocal literature for treble voices. Open to nonmajors. (1 unit per quarter)

74/174. University Orchestra

Open to selected students for preparation and performance in concert of works of the significant orchestral literature. By audition only. (1 unit per quarter)

75/175. Guitar Ensemble

Open to selected students for preparation and performance of ensemble literature for classical guitar. (1 unit per quarter)

82/182. Accompanying

Supervised accompanying of recitals or chamber performances. By permission only. (1 unit per quarter)

MUSIC HISTORY AND LITERATURE

20. Introduction to Music

How to listen to music; art of music and its materials; styles and musical forms; music of the seventeenth through twentieth centuries. Open to nonmajors. Prerequisite to all music history and composer classes in the Department of Music.

21. Music of Antiquity Through the Renaissance

History of Western music from its beginning through the sixteenth century. Open to nonmajors with permission of instructor. *Prerequisite: Music 20.*

22. Music of the Baroque Era

History of the important musical developments from 1600 to 1750. Open to nonmajors with permission of instructor. *Prerequisite: Music 20.*

23. Music of the Rococo and Classic Eras

History of the important musical developments from 1725 to 1830. Open to nonmajors with permission of instructor. *Prerequisite: Music 20.*

36. History of American Popular Music

Examination of American music from the colonial period to the present, including folk music, jazz, show music, and rock. Open to nonmajors.

38. History of Rock Music

Survey of rock music from its beginnings to the present. Emphasis on the artistic and sociological influences of rock on today's society. Open to nonmajors.

124. Music of the Romantic Era

History of the important musical developments from 1800 to 1900. Open to nonmajors with permission of instructor. *Prerequisite: Music 20.*

125. Music of the Twentieth Century

History of the important musical developments from 1900 to the present. Open to nonmajors with permission of instructor. *Prerequisite: Music 20.*

127. Organ Literature

Survey of the important organ literature from 1500 to the present. Taught every other year.

128. Piano Literature

Survey of the important piano literature from 1700 to the present. Taught every other year.

129. Vocal Literature

Survey of the important vocal literature from 1600 to present. Taught every other year.

130. Choral Literature

Sacred and secular choral music from the fifteenth century to the present. Taught every other year.

134. Performance Practice Problems Since 1600

Styles of solo and ensemble performance of instrumental and vocal music from Baroque to the present. Changing aspects of medium, tempo, rhythm, dynamics, phrasing, ornamentation, articulation, temperament, etc.

135. Music Criticism

Problems, principles, and procedures of descriptive and critical analysis and synthesis; relationship of language to description and criticism.

139. J. S. Bach

Life and works of Bach, with special emphasis on development of his musical style; detailed study of a selection of his chief works. Open to nonmajors. Taught every other year. *Prerequisite: Music 20.*

140. Beethoven

Life and works of Beethoven. Emphasis on development of his musical style. Analysis of representative works. Open to nonmajors. Taught every other year. *Prerequisite: Music 20.*

142. Stravinsky

Stravinsky as a central figure of twentieth-century music; his musical styles and their sources. Open to nonmajors. Taught every other year. *Prerequisite: Music 20.*

THEORY AND COMPOSITION

51.01. Theory I

Preparatory course to all theory instruction. Listening techniques and basic principles of music. A student who fails this course may not major in music. Must be taken concurrently with 51.02. Open to nonmajors.

51.02. Theory I: Ear Training

Beginning sight-singing, melodic dictation, rhythmic dictation, harmonic dictation, and keyboard skills. Must be taken concurrently with 51.01. Open to nonmajors.

52.01. Theory II

Continuation of 51.01. Basic terminologies and problems of notation, melody and rhythm, and harmony and their relationship to musical form. Lecture and drill in writing melodies and analysis. Must be taken concurrently with 52.02. Open to nonmajors with permission of instructor. *Prerequisite: Music 51.01 or approval of instructor.*

52.02. Theory II: Ear Training

Continuation of 51.02. Must be taken concurrently with 52.01. Open to nonmajors with permission of instructor.

53.01. Theory III

Continuation of 52.01. Secondary triadic harmonies. Lecture and drill in basic part writing, analysis, and composition. Must be taken concurrently with 53.02. Open to nonmajors with permission of instructor. *Prerequisite: Music 52.01.*

53.02. Theory III: Ear Training

Continuation of 52.02. Must be taken concurrently with 53.01. Open to nonmajors with permission of instructor.

54.01. Theory IV

Continuation of 53.01. Modulation and chromatic harmony. Analysis of standard classical forms. Must be taken concurrently with 54.02. Open to nonmajors with permission of instructor. *Prerequisite: Music 53.01.*

54.02. Theory IV: Ear Training

Continuation of 53.02. Must be taken concurrently with 54.01. Open to nonmajors with permission of instructor. *Prerequisite: Music 53.02.*

55.01. Theory V: Tonal Counterpoint

Analysis of contrapuntal procedures and compositions of the eighteenth century; writing of inventions, chorale preludes, canons, and fugues. Emphasis on the styles of J. S. Bach. Must be taken concurrently with 55.02. Open to nonmajors with permission of instructor. *Prerequisite: Music 54.01.*

55.02. Theory V: Ear Training

Continuation of 54.02. Must be taken concurrently with 54.01 Open to nonmajors with permission of instructor. *Prerequisite: Music 54.01*

56.01. Theory VI: Twentieth-Century Practice

Continuation of 55.01. Analysis of twentieth-century techniques: a study of serialism and its development. Must be taken concurrently with 56.02. Open to nonmajors with permission of instructor. *Prerequisite: Music 55.01.*

56.02. Theory VI: Ear Training

Continuation of 55.02. Must be taken concurrently with 56.01. Open to nonmajors with permission of instructor. *Prerequisite: Music 55.02.*

155. Advanced Keyboard Harmony and Music Reading Skills

Intensive keyboard training in figured bass, harmonizing a given soprano, modulations to all keys, transposing, and open-score reading. Taught every other year. *Prerequisite: Music 55.01.*

156. Modal Counterpoint

Sixteenth century. Analysis of contrapuntal procedures and representative compositions; writing of motets and masses. Emphasis on style of Palestrina. For music theory and composition students only. *Prerequisite: Music 55.01.*

158. Orchestration

Ranges, tonal possibilities, technical limitations, and necessary transpositions for all orchestral instruments. Taught every other year. *Prerequisite: Music 55.01.*

159. Advanced Orchestration

Practical orchestration in all its applications. *Prerequisite: Music 158.*

162. Composition

Organization of musical ideals into logical and homogeneous form. Emphasis on traditional forms. *Prerequisite: Music 55.01.*

TECHNIQUES AND CONDUCTING

69. Eurhythmics

Jaques-Dalcroze system. Special application of this system using a wide gamut of musical literature. *Prerequisite: Music 20 or 51.01.*

165. Conducting

Baton techniques, fundamentals of score reading, rehearsal techniques, choral and instrumental tone, interpretation of music. Use of full orchestral score. Preparation and performance of major works. Taught every other year.

166. Vocal Pedagogy

Techniques and materials of vocal teaching.

167. Piano Pedagogy

Techniques and materials of piano teaching.

168. Organ Pedagogy

Techniques and materials of organ teaching.

179. Diction: English and Italian

Drills and class performance using the International Phonetic Alphabet.

180. Diction: French

Drills and class performance using the International Phonetic Alphabet.

181. Diction: German

Drills and class performance using the International Phonetic Alphabet.

191. Seminar in Arts Administration

Multidisciplinary studies in fine arts, music, and theatre arts in the problems of art administration (cf. Art 191 and Theatre and Dance 191).

COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF PHILOSOPHY

Professors: James W. Felt, S.J., Manuel G. Velasquez
Associate Professors: Philip J. Kain, William A. Parent, William J. Prior, Carol J. White *(Chair)*
Assistant Professors: Christopher B. Kulp, Michael J. Meyer, Elizabeth S. Radcliffe
Austin J. Fagothey, S.J., Professor: Alan Donagan
Charles J. Dirksen Professor of Business Ethics: Manuel G. Velasquez

Philosophy inquires directly into the relation of the human person to the world: what we are, how we know, what values are, how we live humanly. Worth pursuing for its own sake, philosophical inquiry also promotes analytical thinking and precise expression and thus is excellent undergraduate preparation for a number of professional careers, such as law, government, writing, social work, and computer programing.

REQUIREMENTS FOR MAJOR

Students choosing philosophy as their major, in addition to the general requirements for the University and for the Bachelor of Arts degree in the College of Arts and Sciences, must complete at least twelve philosophy courses including the following:

1. Four lower-division courses: Philosophy 11, 12, and 13 (Western Culture sequence) and Philosophy 25 or 27 (Logic). Philosophy majors should complete at least 11, 12, and 25 or 27 before enrolling in any upper-division philosophy courses.
2. Eight upper-division courses including 195 and four selected from the courses numbered 130–139: 130 (Symbolic Logic), 131 (Ancient Philosophy), 132 (Medieval Philosophy), 133 (Modern Philosophy), 135 (Metaphysics), 136 (Theory of Knowledge), 137 (Ethical Theory), 139 (Analytic Philosophy)

A minor in philosophy is also available.

HONORS PROGRAM

The Honors Program provides encouragement for superior students to qualify themselves for graduate work in philosophy or some other field. Applicants may be admitted to this program by the chair. Interested students should inquire for particulars at the office of the department chair.

INTRODUCTORY-LEVEL COURSES

General Introduction

4. Introduction to Philosophy

Introduction to philosophy. Consideration of the problems raised in at least three major areas: ethics, metaphysics, and epistemology Recommended as a beginning course in philosophy.

5. Ethical Issues in Society

Formal inquiry into normative ethics. Special attention to general ethical principles and to the practical application of these principles to current ethical issues in society. Topics may include the concepts of freedom, obligation, value, rights, justice, virtue, and moral responsibility, as applied to issues like abortion, punishment, economic distribution, racial and sexual discrimination, sexuality, political obligation, nuclear war, and pornography. Satisfies ethics requirement for the bachelor's degree in all undergraduate colleges.

6. Ethical Issues in Business

Formal inquiry into normative ethics. Special attention to general ethical principles and the application of these principles to current moral issues in business. Topics may include truth in advertising, corporate social responsibility, affirmative action, capitalism, government regulation, quality of work-life, environmental and resource issues, and ethical codes of conduct. Satisfies ethics requirement for the bachelor's degree in all undergraduate colleges.

7. Ethical Issues in Medicine

Formal inquiry into normative ethics. Special attention to general ethical principles and the application of these principles to current moral issues in medicine and the health sciences. Topics may include the definition of death, informed consent, distribution of health care, euthanasia, genetic manipulation, artificial conception, prolongation of life, and organ transplants. Satisfies ethics requirement for bachelor's degree in all undergraduate colleges.

8. Ethical Issues in Politics

Formal inquiry into normative ethics. Emphasis on moral issues in politics and public policy. Topics include the concepts of rights, justice, dignity, equality, personhood, desert, retributivism, and utility. Issues discussed may include discrimination and preferential treatment, capital punishment, abortion, pornography and censorship, sexual equality, world hunger, and animal rights. Satisfies ethics requirement for bachelor's degree in all undergraduate colleges.

9. Ethical Issues in Journalism

Formal inquiry into normative ethics. Emphasis on moral issues encountered by journalists in both the print and broadcast media. Topics may include the formulation of professional ethical standards, confidentiality, violence in the news, bias, commercial pressures, censorship, equal access, and the depiction of minorities and women. Satisfies ethics requirement for bachelor's degree in all undergraduate colleges.

Western Culture Sequence

11. Western Culture: Philosophy I, Classical & Medieval

Beginnings of Western philosophy. Representative writers of the Greek and medieval traditions, with attention to their historical and literary milieu and their relevance to contemporary thought. With Philosophy 12 and 13, satisfies Western Culture sequence requirement for the bachelor's degree in all undergraduate colleges.

12. Western Culture: Philosophy II, Early Modern

Principal fashioners of the modern mind. Seventeenth- and eighteenth-century philosophers studied in the historical and literary context of their times. Their impact on the present. With Philosophy 11 and 13, satisfies Western Culture sequence requirement for the bachelor's degree in all undergraduate colleges.

13. Western Culture: Philosophy III, Modern & Contemporary

Introduction to the closer roots of modern thinking, from the critical revolution of Kant to some of the dominant currents of the twentieth century. With Philosophy 11 and 12, satisfies Western Culture sequence requirement for the bachelor's degree in all undergraduate colleges. *Prerequisite: Philosophy 12 strongly recommended.*

Courses for Special Interests

25. Informal Logic

Introduction to the art of logical reasoning. Emphasis on the ability to recognize common fallacies of argumentation.

27. Introduction to Formal Logic

Introduction to the study of deductive inference, including traditional and modern techniques.

31. Christian Philosophy

Interface of Christianity and philosophy. Consideration of topics of interest to theology and philosophy in their respective understanding of human experience.

INTERMEDIATE-LEVEL COURSES

Normal prerequisite for non-Ethics courses: at least one Introductory-Level course

110. Ethics in the Health Professions

Formal inquiry into applied ethics. Emphasis on moral issues encountered by members of the health professions. Topics may include the formulation of professional ethical standards and the examination of moral dilemmas in medicine, psychological counseling, and other areas of health care. Satisfies ethics requirement for the bachelor's degree in all undergraduate colleges.

112. Ethics in Management

Formal inquiry into applied ethics. Emphasis on moral issues encountered by managers. Topics may include the role of ethical principles in business and ethical dilemmas raised by the management and administration of business organizations such as conflicts of interest, organizational politics, commercial bribery, whistleblowing, labor-management conflicts, and consumerism. Satisfies ethics requirement for the bachelor's degree in all undergraduate colleges.

113. Ethics in the Law

Formal inquiry into applied ethics. Emphasis on important issues in the formation and the practice of law. Topics may include the relationship between legal and moral obligation, moral principles underlying the law, and the nature of legal reasoning. Satisfies ethics requirement for the bachelor's degree in all undergraduate colleges.

114. Classic Issues in Ethics

Exploration of the fundamental questions of ethics through close study of some of the great works of moral philosophy such as Plato's *Republic*, Aristotle's *Nicomachean Ethics*, Kant's *Groundwork*, and Mill's *Utilitarianism. Prerequisite: upper-division standing.* Satisfies ethics

requirement for the bachelor's degree in all undergraduate colleges.

115. Political Philosophy and Ethics

Moral issues in political philosophy, especially traditional ethical justifications for political authority. Topics may include theories of political authorization and contract theory, rights, liberty, equality, justice, community, revolution, civil disobedience, and others. Satisfies ethics requirement for bachelor's degree in all undergraduate colleges. *Prerequisite: upper-division standing.*

116. Marx and Ethics

Examination of Marx's ethical thought in the context of traditional ethical theory (Aristotle, Kant, Mill) and in relationship to his political views and philosophy of history. Topics may include alienation, the human essence, the individual, community, needs, freedom, equality, rights, and justice.

120. Philosophy and the Sexes

Philosophical examination of theories of sex differences and relationships between the sexes in the past, the present, and possible futures. Readings from traditional and contemporary sources.

121. God and Philosophy

Philosophical inquiry, based on both classical and contemporary views, as to whether the existence of god can be rationally demonstrated, whether it is compatible with evil, how human beings relate to God, the nature of faith, and the nature of religious language.

122. Philosophy of Language

Survey of recent philosophical work on the nature of language and its relation to the rest of the world. Semantics and presuppositions of linguistic theory.

126. Existentialism

General introduction to existentialism in its analysis of the basic structures of human existence, particularly freedom, and in its major thinkers. *Prerequisite: Philosophy 12, or permission of instructor.*

127. Lonergan

Examination of the work of the contemporary philosopher Bernard Lonergan and his attempt to find a new foundation for the traditional branches of philosophy and the natural and social sciences.

130. Symbolic Logic

Study of various topics in modern symbolic logic. *Prerequisite: Philosophy 27 or permission of instructor.*

131. Ancient Philosophy

Study of one major philosopher or philosophical issue (such as substance, causation, or virtue) from the ancient period. Specific variations include 131a (Socrates), 131b (Plato), and 131c (Aristotle). *Prerequisite: Philosophy 11.*

132. Medieval Philosophy

Study of one major philosopher or philosophical issue (such as universals, existence and the nature of God, or free will) from the medieval period. Specific variations include 132a (Augustine) and 132b (Aquinas). *Prerequisite: Philosophy 11.*

133. Modern Philosophy

Study of one major philosopher or issue (such as mind and body, skepticism and knowledge, or causation) from the modern period. Specific variations include 133a (Hume), 133b (Kant), and 133c (Hegel). *Prerequisite: Philosophy 12.*

135. Metaphysics

Examination of major issues in metaphysics. Topics may include the nature and possibility of metaphysics, free will and determinism, the mind/body problem, personal identity, and metaphysical issues arising in science. *Prerequisites: Philosophy 11, 12, and 25 or 27.*

136. Theory of Knowledge

Examination of major issues in the theory of knowledge. Topics may include justification of belief, a priori knowledge,

perception, and theories of truth. *Prerequisites: Philosophy 12, and 25 or 27.*

137. Ethical Theory

Examination of major philosophers or issues in moral and social philosophy. Topics may include dignity, moral rights and obligations, justice, moral relativism, virtue, the good, and happiness. *Prerequisite: Philosophy 25 or 27.*

139. Analytic Philosophy

Examination of the major current in twentieth-century Anglo-American philosophy. Philosophers studied may include Frege, Russell, Carnap, Moore, Wittgenstein, and Austin; movements may include logical positivism and ordinary-language philosophy. *Prerequisites: Philosophy 12, and 25 or 27.*

142. Philosophy of Law

Proper limits and uses of the criminal law in regulating human behavior. No philosophy prerequisite.

145. Aesthetics

Philosophical examination of the historical development of the concepts of taste and beauty.

ADVANCED-LEVEL COURSES

Normal prerequisites: two Intermediate-Level courses

170. Contemporary European Philosophy

Selected topics from twentieth-century European philosophy: movements such as phenomenology and structuralism; philosophers such as Husserl, Heidegger, Merleau-Ponty, Sartre.

175. Philosophy of Mind

Investigation of the logical structure of psychological concepts, such as those of sensation, images, beliefs, thoughts, intentions, expectations.

190. Advanced Topics in Philosophy

Selected philosophical problems studied at an advanced level.

195. Senior Seminar

Investigation of philosophical methodology. Enrollment restricted to senior philosophy majors and minors.

198. Senior Research Thesis

Creation of a carefully researched and scholarly paper, under the active direction of a selected member of the department's staff. Of particular value to senior students who intend to pursue graduate studies.

199. Directed Research

Tutorial work, with demanding requirements, for advanced students in particular problem areas not otherwise accessible through courses. By previous arrangement only, with the instructor, department chair, and dean.

COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF PHYSICS

Professor Emeritus: William A. Barker II
Professors: John B. Drahmann, William T. Duffy, Jr. *(Chair),*
Carl H. Hayn, S.J., Philip T. McCormick
Associate Professor: David B. Fenner
Assistant Professor: William R. Johanson
Acting Assistant Professor: David A. Boness

The Department of Physics offers major programs of lecture and laboratory instruction leading to the Bachelor of Science degree in Physics and the Bachelor of Science degree in Engineering Physics. The department also provides an academic minor in physics and required and elective courses for students majoring in other fields.

The physics major usually aims at one of three goals: graduate study in physics or related fields, professional employment by industry or government, or secondary school teaching in physical science. The undergraduate major program in physics is appropriate preparation for graduate study in the fields of physics, astronomy and astrophysics, biophysics, environmental science, geological science and geophysics, medical physics and medicine, patent law, physical science teaching, and oceanography.

The engineering physics major, particularly appropriate for the applied science student who wishes to do research and development, covers a broad spectrum of courses in mathematics, engineering, and physics. In view of today's rapidly changing technology, the assignments of young engineers or physicists employed by industry will likely involve new technologies that they haven't previously assimilated. This program emphasizes, to a greater extent than the traditional engineering major, the *physics* fundamentals that are applicable to the new technologies as well as to the more established ones.

REQUIREMENTS FOR MAJOR

Bachelor of Science in Physics

The physics major must fulfill the University and College requirements (pages 33–34) and the following departmental requirements:

1. Chemistry 5 and 6
2. Mathematics 10, 11, 12, 13, 21, and 22
3. Physics 4, 5, 6, and 7 (introductory physics sequence)
4. A series of intermediate-level courses in the subject areas of electronics, classical mechanics, electromagnetism, thermal physics, mathematical physics, and quantum physics. The usual major program will therefore include Physics 70, 101, 102, 111, 112, 120, 121, 122, 131, 132, and 170.
5. For graduate study in physics or related fields, additional elective physics and mathematics courses and research participation

Consult the publication *Information for Physics and Engineering Physics Majors* regarding a special curriculum for students who are preparing for careers in biophysics, medical physics, or medicine.

A state-approved physics waiver program is available to prepare students for the secondary school teaching of physical science in California. The course requirements for a B.S. degree conforming to this waiver program involve fewer intermediate-level physics courses than the usual major and more courses in chemistry and earth science. Contact the department chair for more information.

For students with broad interests crossing into other disciplines, such as biology, chemistry, computer science, electrical engineering, mathematics, or philosophy, specialized curricula should be developed in consulation with the student's departmental faculty adviser.

Additional details about careers and curricula are available in the publication mentioned above.

Bachelor of Science in Engineering Physics

The Engineering Physics major must fulfill the University and College requirements, with the modification that this major requires 193 quarter units in an approved curriculum. Curricula are approved by the Engineering Physics Committee consisting of Professor Duffy (Physics), Professor Saad (Mechanical Engineering), and Professor Yarbrough (Electrical Engineering and Computer Science). The departmental requirements are listed below.

1. Chemistry 5 and 6; Mathematics 11, 12, 13, and 21; Applied Mathematics 106
2. Physics 4, 5, 6, 7, 70, 101, 102, 111, 112, 131, 132, and 170
3. EECS 4, 100, and 110; MECH 10, 121, and 122; CENG 43
4. Elective courses in engineering and/or science directed toward a special emphasis area (3–6 term courses)
   Example: Solid-State Science Emphasis
   EECS 151 (Semiconductor Devices I)
   EECS 152 (Semiconductor Devices II)
   MECH 15 (Introduction to Material Science)
   Physics 116 (Physics of Solids)
   Physics 120 (Thermal Physics)
   Physics 121 (Quantum Physics I)
   Other special emphasis areas are (1) electronics, (2) systems and networks, (3) optics, (4) energy sources and thermodynamics, and (5) nuclear science
5. Free electives (3–4 term courses)

HONORS PROGRAM AND RESEARCH PARTICIPATION

Freshman applicants planning to major in physics or engineering physics may also consider separate application for admission to the Honors Program. Among other benefits, honors students are admitted to special honors sections

of certain courses offered by the departments of Economics, English, History, Mathematics, Philosophy, and Religious Studies.

Undergraduate research participation and independent study opportunities are available under the direction of the physics faculty. Research in the department is currently funded by NASA and National Science Foundation. Course credit for undergraduate research participation is available under Physics 198; course credit is provided for independent study under Physics 199.

LOWER-DIVISION COURSES

1. Great Ideas of Physics

Descriptive course intended to acquaint students of the humanities with physics as a human activity. Emphasis on the concepts of Galileo, Newton, Einstein, and Heisenberg and the impact of their ideas on the general culture of the twentieth century. Not open to physical science or engineering majors. No laboratory. Fall term. (4 units)

3. Introduction to Astronomy

A brief history of the science of astronomy is followed by a thorough study of the modern theory of stellar evolution. Examination of the origin and structure of current models of the universe. (4 units)

4. Physics for Scientists and Engineers I

Measurement. Vectors. Straight-line kinematics. Kinematics in two dimensions. Laws of inertia, mass conservation, and momentum conservation. Center-of-mass and reference frames. Force. Newtonian mechanics and its applications. Work and kinetic energy. Potential energy and energy conservation. Rotational dynamics. Laboratory. Problem session. Spring term. *Prerequisites: Math 11 and 12. (Math 12 may be taken concurrently.)* (5 units)

5. Physics for Scientists and Engineers II

Gravitation. Kepler's laws. Simple harmonic motion. Fluid mechanics. Electrostatics. Gauss's law. Potential. Capacitance. Electric current. DC circuits. Kirchhoff's rules. Magnetic forces and field. Laboratory. Fall term. *Prerequisites: Physics 4 and Math 13. (Math 13 may be taken concurrently.)* (5 units)

6. Physics for Scientists and Engineers III

Electromagnetic induction. AC circuits. Waves. Geometrical optics. Interference, diffraction, and polarization. Thermal properties and kinetic theory of gases. Thermodynamics. Laboratory. Winter term. *Prerequisite: Physics 5.* (4 units)

7. Physics for Scientists and Engineers IV

Special relativity. Quantum waves and particles. Schroedinger equation. Atomic structure. Nuclear structure and decay. Statistical physics. Solids. Semiconductors. Laboratory. Spring term. *Prerequisite: Physics 6.* (5 units)

51. Introduction to Earth Science

Overview of geology and its significance to man. Earthquakes, volcanism, plate tectonics and continental drift, rocks and minerals, geologic hazards, mineral resources. Emphasis on basic geologic principles and the role of geology in the world today. Winter term. (4 units)

70. Electronic Circuits for Scientists I

Linear electric circuits. Phasor analysis, transients, and Fourier series. Network theorems. Junction diodes, bipolar junction transistors, and field-effect transistors. Voltage amplifiers. Laboratory. Spring term. *Prerequisite: Physics 6.* (5 units)

UPPER-DIVISION COURSES

101. Analytical Mechanics I

Review of vectors, vector calculus, and coordinate transformations. Particle kinematics and Newtonian dynamics. Oscillations. Central forces. Systems of particles. Fall term. *Prerequisite: Physics 4.* (5 units)

102. Analytical Mechanics II

Rigid body mechanics. Calculus of variations. Methods of Lagrange and Hamilton. Stability and coupled oscillators. Elastic bodies. Winter term. *Prerequisite: Physics 101 or Civil Engineering 42.* (5 units)

106. General Physics I

Vectors. Newtonian laws of motion. Gravitational forces and acceleration. Momentum. Laws of equilibrium. Torques, moment of inertia, and rotational motion. Work and energy. Thermal energy, heat transfer, entropy, and thermodynamics. Fall term. *Prerequisites: basic algebra and trigonometry.* (4 units)

107. General Physics II

Fluid statics and dynamics. Elastic deformations. Vibrations and wave motion. Superposition principle. Sound. Optics. Relativity. Laboratory. Winter term. *Prerequisite: Physics 106.* (4 units)

108. General Physics III

Electricity and magnetism. Ohm's law. Coulomb's law. Electric fields and potential. D-C circuits. Capacitors. Faraday's law. A-C circuits. Wave-particle duality. Atomic and nuclear physics. Quantum mechanics. Laboratory. Spring term. *Prerequisite: Physics 107.* (4 units)

111. Electromagnetic Theory I

Electrostatic fields. Laplace's and Poisson's equations. Dielectrics. Magnetic fields of steady currents. Induced electromotive forces. Magnetic energy. Magnetic materials. Winter term. *Prerequisite: Physics 6.* (5 units)

112. Electromagnetic Theory II

Maxwell's equations. Plane waves in free space and in matter. Reflection and refraction. Interference and diffraction. Polarization. Guided waves. Radiation of electromagnetic waves. Spring term. *Prerequisite: Physics 111.* (5 units)

113. Optics

Geometrical optics. Interference. Fraunhofer and Fresnel diffraction. Optical instruments. Polarization. Crystal optics. Selected topics from contemporary optics. Laboratory. Winter term. Offered alternate years. Offered 1990. *Prerequisite: Physics 6.* (5 units)

116. Physics of Solids

Crystal structure. Phonons. Free electron theory of metals. Band theory of solids. Magnetism. Superconductivity. Spring term. *Prerequisites: Physics 7 and senior standing.* (5 units)

120. Thermal Physics

Laws of thermodynamics with applications to ideal and non-ideal systems. Elementary kinetic theory of gases. Entropy. Classical and quantum statistical mechanics. Selected topics from magnetism and low temperature physics. Winter term. Offered alternate years. Not offered 1990. *Prerequisite: Physics 7.* (5 units)

121. Quantum Physics I

Thermal radiation. Wave-particle duality. Bohr atom. Schroedinger wave mechanics. One-electron atoms. Atomic moments, spin, and transitions. Multielectron atoms. Hartree theory. Optical excitations. Zeeman effect. Laboratory. Fall term. *Prerequisites: Physics 7 and 102.* (5 units)

122. Quantum Physics II

Molecules, bonding, and spectra. Nuclear models and structure. Nuclear decay and reactions. Elementary particles and quark theory. Strong and weak nuclear forces.

Laboratory. Winter term. *Prerequisite: Physics 121.* (5 units)

125. Quantum Mechanics

Wave packets and the uncertainty relations. Schroedinger wave equation. Eigenfunctions and eigenvalues. One-dimensional potentials. Schroedinger equation in three dimensions. Angular momentum. Radial equation. Hydrogen atom. Spring term. *Prerequisite: Physics 101.* (5 units)

131. Methods of Mathematical Physics I

Linear vector spaces. Coordinate transformations. Eigenvalue problems. Abstract formalism of vector spaces. Legendre functions. Bessel functions. Function spaces and expansions in orthogonal sets. Spring term. *Prerequisite: Math 22 or Applied Math 106.* (5 units) NCX†

132. Methods of Mathematical Physics II

Functions of a complex variable as mappings. Basic properties of analytic functions. Series expansion of complex functions. Poles on the contour. Analytic continuation. Contour integration. Method of steepest descent. Transform techniques and conformal mapping. Dispersion relations. Fall term. *Prerequisite: Physics 131.* (5 units) NCX†

170. Electronic Circuits for Scientists II

Voltage and power amplifiers. Logic gates and digital circuits. Small-signal models. Feedback and waveform generation. Operational amplifiers. Laboratory. Fall term. *Prerequisite: Physics 70.* (5 units)

198. Undergraduate Physics Research

Departmental work under close professorial direction on research in progress. Permission of the professor directing the research must be secured before registering for this course. Restricted to physics majors, engineering physics majors, and honors students with a 3.0 or better grade point average. Fall, winter, and spring terms.

199. Directed Reading in Physics

Detailed investigation of some area or topic in physics that is not covered in the regular courses; supervised by a faculty member. Permission of the professor directing the study must be secured before registering for this course. Restricted to students with a 3.0 or better grade point average. Fall, winter, and spring terms.

†Exempted from challenge

COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF POLITICAL SCIENCE

Professors Emeriti: Bernard L. Kronick, Richard J. Roberts, S.J.
Professor: Eric O. Hanson
Associate Professors: Jane Leftwich Curry, Janet A. Flammang *(Chair),* Dennis R. Gordon, Timothy J. Lukes, William J. Stover
Assistant Professor: Peter I. Minowitz
Acting Assistant Professor: Terri Peretti

The Department of Political Science introduces students to the political aspects of society and the analysis of political behavior, values, institutions, and

government. It also offers preparation for various graduate and professional studies and careers in public service. Special emphasis programs are available to political science majors in political economy, pre-law, public administration, and television communication and public affairs.

REQUIREMENTS FOR MAJOR

In addition to the general University and College requirements (pages 31–33), a student majoring in political science must satisfactorily complete the following requirements:

1. Two mathematics courses, selected from one of the following:
   a. Mathematics 6 (Finite Mathematics) and 7 (Calculus for Social Science)
   b. Mathematics 11 and 12 (Calculus and Analytic Geometry I and II)
   c. Mathematics 6 (Finite Mathematics) and 8 (Statistics)
   d. Mathematics 11 (Calculus and Analytic Geometry I) and 8 (Statistics); other statistics courses may replace Mathematics 8.
2. Eleven term courses in political science:
   a. Political Science 1, 2, 25, 30 (taken during the freshman and sophomore years, preferably in sequence)
   b. Seven upper-division courses in political science. Of these seven courses, there must be at least one lecture course from each of these four areas of political science: American Politics, Comparative Politics, International Relations, or Political Theory and Methodology.
3. Among the seven upper-division courses, a political science seminar, taken during the senior year
4. An average grade of C or better in political science courses

A minor in political science is also available.

SPECIAL PROGRAMS

Political science majors may select one of several emphasis programs. These are not narrow specializations, but aim at a particular competence within the major program. The completion of a special emphasis program may be noted on a student's transcript if the student notifies the department chair and the chair approves the notation. Detailed programs of study listing recommended courses for each emphasis may be obtained from the department chair.

Political Economy Emphasis

An emphasis program offered with the Department of Economics emphasizing the interdependence of economics and political science in the analysis and solution of current domestic and world problems.

Pre-Law Emphasis

An emphasis program available to those political science majors considering graduate study in law school and legal careers.

Public Administration Emphasis

An emphasis program combining political science with a program of courses dealing with enforcement of public policy, available to those majors planning careers in public service or business.

Television Communication and Public Affairs Emphasis

An emphasis program linking political analysis with broadcast journalism and allowing the political science major to communicate political ideas, events, and personalities through the medium of television.

Honors Program

The Honors Program provides well-qualified students with special opportunities for training and research in political science through seminars, tutorials, and research projects.

Application for admission to the Honors Program normally should be made in the sophomore year. Applicants must have achieved a 3.5 average or better in all University work and a 3.7 average or better in political science.

Honors candidates will complete all requirements for a major in political science and will also submit a research project during their senior year. Graduation with honors in political science will require (1) a 3.5 average or better in all University work, (2) a 3.7 average or better in political science, (3) the submission of an acceptable research project, and (4) completion of such courses as the Honors Committee may designate. Interested students should consult the chair.

External Programs

The Political Science Department makes available to qualifying students opportunities to participate in a variety of programs that combine practical field experience and academic credit.

These programs involve many levels of political activity:

1. On the international level, the department sponsors a United Nations Program with participation open to all undergraduate students. Students in the Model U.N. may elect to take Political Science 26 for 2 units of credit. Additionally, students may study at the United Nations itself through a program with Drew University in New York.
2. On the national level, Santa Clara is a member school of American University's Washington, D.C., program, in which students receive credit for internships and intensive seminars at the national capital.

3. On the state level, Santa Clara is affiliated with the Capital Campus Program at the University of California, Davis. It is much like the Washington Program, except it focuses on state government.
4. On the local level, the department assists students in arranging academic credit for internships in local politics. Students may work for government agencies, legislative or judicial bodies, political parties, or politically related groups. From time to time, the department offers courses that combine local internships with classroom work.

LOWER-DIVISION COURSES

1. Introduction to American Politics

Critical analysis of American political values, institutions, and processes. America's political tradition, the Constitution, the presidency, Congress, the bureaucracy, Supreme Court, elections, political parties, interest groups, mass media, domestic policies, and foreign policy.

2. Introduction to Comparative Politics

Government and politics in several modern states. Emphasis on the development of analytical abilities and critical skills in the evaluation of political culture, processes, and institutions.

25. Introduction to International Relations

Conceptual models used to analyze international relations, contemporary problems of world politics, and the methods states use to provide peace and security.

26. International Organization Laboratory

Students simulate U.N. operations by representing member-nations, debating and preparing resolutions, and engaging in other aspects of diplomacy. Open to all undergraduates. Students participating in the Model U.N. are encouraged to take this course. May be repeated for credit. (2 units)

30. Introduction to Political Theory

An exploration of some of the principal themes and questions of political theory through the writings of Plato, Machiavelli, Marx/Engels, and Mill. Prominent themes include theory and practice, individual liberty, morality and politics, freedom, obligation, and justice.

40. Social Forces in Politics§

Impact of social movements on political change. Goals and means of women and minority movements as well as the political aspects of changing life styles.

45. Criminal Justice System

Basic understanding of the criminal justice system in the United States: police, courts, probation, imprisonment, parole, relations with other governmental agencies. Goals, successes, and failures of the system, and possible remedies.

90. Selected Studies in Public Policy

Introduction to the formulation and implementation of selected public policies in domestic or foreign policy areas.

§Course included in Ethnic Studies program

UPPER-DIVISION COURSES

Prerequisites for all upper-division courses:

1. For *Political Theory and Methodology* courses, 30 is required.
2. For *International Relations* courses, 25 is required.
3. For *Comparative Politics* courses, 2 is required.
4. For *American Politics* courses, 1 is required.
5. For *Senior Course Work* at least one upper-division lecture course in 1–4 above of the seminar, practicum, or directed reading course is required. (In special cases, the instructor of a particular course may make an exception to these requirements.)

Political Theory and Methodology

102. Political Ideology

Conflicting critiques of contemporary issues using different political topics—ecology, urban living, democratic movements, racial and ethnic relations, domination and liberation, the role of violence—to explore contrasting theoretical understanding of those issues. Differences among liberalism, socialist theory, conservative, and anarchist thought.

103. Approaches to the Study of Politics

Theoretical examination of different approaches to the study of politics. Competing theories, paradigms, and types of evidence in the social sciences. Representative methodologies for political research.

106. Political Conservatism and Industrial Society

Forms of conservatism—temperamental, possessive, practical, philosophical—and their bearing on political conservatism. Major conservative thinkers.

108. Catholic Political and Social Thought

Survey of Catholic theories of church-state relations in history and at present. Catholic thought on state authority, forms of government, and purposes of society and the state. Evaluation of socialism, capitalism, and liberalism, from the Catholic viewpoint of nature and destiny of the human person.

111. History of Political Theory I: The Classical Tradition: Greek and Christian

Development of Western political thought from its Greek origins in the work of Plato and Aristotle through the work of Aquinas.

112. History of Political Theory II: Liberalism and Its Roots

Continuation of 111. Western political thought from Machiavelli through the origins of liberalism in the writings of Hobbes, Locke, and Rousseau.

113. History of Political Theory III: Post-Liberal Theories

Writers and themes in nineteenth- and twentieth-century political thought including Marx, Nietzsche, Freud, and Lenin.

117. American Political Theory I: The Puritan Founding to the Civil War

Development of American political thought from the Puritan period through the reconstruction of the American political and social order following the Civil War. Conceptions of freedom, private self, and public order, in the context of the racial, social, and economic development of the American Republic.

118. American Political Theory II: The Civil War to the Present

Development of American political conceptions from the late nineteenth century to the present. Focus on questions of social order, the role of the state, violence and social reform, racial and industrial justice, and the future of politics in an industrial and urban society.

International Relations

125. International Law

Sources, nature, and functions of international law in world politics. Special attention to the subjects of international law, international transactions, and the rules of war. Viewpoints presented from Western, socialist, and Third World perspectives.

126. International Organization

International organization in world affairs. Political, economic, and social role of the United Nations, regional organizations, specialized agencies, and nonstate transnational actors.

127. Comparative Foreign Policies

Comparative study of the foreign policies of selected nation-states. Interaction of international and domestic politics in foreign policy formulation and implementation.

128. American Foreign Policy

Aims, formulation, and implementation of U.S. foreign policy since World War II, especially toward the Soviet Union, Europe, China, and selected less developed countries.

129. Soviet Foreign Policy

Analysis of Soviet foreign policy, the communist world, and the international political system. Impact of ideology on relations with the United States, China, and the developing nations.

130. Technology and Development in the Third World

Consideration of the relationship between technology and development in selected Third World nations. Subjects include technology and import substitution, technology and state power, technology and debt, and the search for alternative technologies that meet basic human needs.

135. Far Eastern International Relations

International political developments in the Far East from 1900 to the present. Analyses of the geographic environment, political forces, and the impact of differing cultures on the governmental decision-making process. *Prerequisites: Political Science 2 and 25.*

Comparative Politics

131. The Military in Politics

The political role of the military in both developed and developing societies, using a variety of states as examples. In developing societies, topics include causes of military intervention, legitimacy-building efforts, and withdrawal from politics.

136. Politics in Central America and the Caribbean

Political cultures, processes, and institutions of Mexico and selected Central American and Caribbean states. Governmental organization, dependency, development, and political violence.

137. Politics in South America

Political cultures, processes, and institutions of selected South American nations.

Government, dependency, development, and political violence.

138. Politics in South Africa

Examination of the politics in South Africa, historically and in the context of that nation's interaction with the world community. Topics include politics prior to apartheid; the establishment of apartheid and the growth of the African National Congress; the meaning of Soweto uprisings and recent government policies; and questions of divestment, sanctions, and the future of apartheid.

139. Politics and Religion in East and West

Relationship between religion and politics in selected cultures. Emphasis on traditional East Asia, modern Italy, and contemporary United States.

140. Politics in Less Developed Countries

Multidisciplinary study of the problems and politics of political development in Latin America, Africa, and/or Asia. Case studies of communist and capitalist approaches to political development. Impact of international politics on internal development.

141. Political Leadership

Concerns of personality, role, organization, task, values, and setting. Explanations of motivation and behavior in political leadership sought in elite analysis, belief systems, statecraft, personality theory, charismatic effects, psychobiography, and medical histories.

142. Politics in the Middle East

Designed to give students an understanding of the complexities of Middle East politics, the importance of the region to the world, and the role history and religion have played in the political and social development of the various countries in the region.

143. Politics in Eastern Europe

The social and political processes in Eastern European nations, especially Poland, Hungary, Czechoslovakia, Rumania, and Yugoslavia. Eastern European variations on Soviet communism. Particular attention to the upheavals of Hungary, Poland, and Czechoslovakia and the repression of those upheavals.

144. Politics in Western Europe

Nature, structure, and utilization of political power in Great Britain and continental Europe. Institutional, ideological, cultural, and economic aspects of politics. Emphasis on problems of political stability, regional integration, and social change.

145. Soviet Politics

Analysis of the Soviet political system and its ideological premises. Origin and development of the Soviet party-state and its processes of government and politics.

146. African Politics

The problems of nation-building and economic development in Sub-Saharan Africa. Case studies of Kenya and Tanzania.

147. Politics in Japan

Political history, institutions, and interest groups of modern Japanese political culture.

148. Politics in China

Origins of revolution in modern China, the politics of social and economic modernization in China since 1949, the problems of bureaucratization and political participation, and the succession to Mao Zedong.

149. Comparative Political Systems

Selected public policies in economically advanced societies. Relationship of political culture to social and economic behavior.

American Politics

150. The Presidency

Analysis of the presidency as it has evolved throughout the course of U.S. history. Comparison of presidential powers with those of Congress, the courts, the bureaucracy, the press, political parties, and the public.

151. The Congress

History, structure, and policies of Congress. Congressional elections and theories of representation, the committee system and congressional norms, lobbying, congressional ethics and reforms, and the power of Congress relative to the president and the bureaucracy.

152. Political Participation

An examination of who participates in U.S. politics and the various forms of political participation. Elections, political parties, interest groups, community organizing, and political protest.

153. Ethnic Politics§

The political culture and social reality of ethnic/racial groups in the United States. Relationship of minorities to the social, political, and economic structure. Interpretations of American ethnic/race relationships, extent and nature of ethnic power within the American political-economic structure, effect of the policy process and social programs on ethnic minorities, and minority political movements and organizations. Focus on experience of Chicanos, blacks, Native Americans, and Asian Americans.

154. Women and Politics‡

American women's political consciousness and activity. Alternative theoretical formulations of women's power; history of American feminism; the question of race, sex, and class divisions in America, and women in cross-cultural perspective.

155. Political Economy

Introduction to the relationship of the state to the private market distribution of resources and the achievement of individual and aggregate economic goals. Classical ideas of political economy, the functioning of capitalist and socialist political-economic systems, the role of the state and multinationals in the world and domestic economy, domestic fiscal and monetary policy, and the phenomena of imperialism and corporate power.

156. Politics and Mass Media

Impact of mass media on political values, attitudes, and behavior. Various forms of mass communication: print, graphic art, and film. Special attention to television.

157. U.S. Constitutional Development I

Historical treatment spanning 1607–1890. English and colonial constitutional heritage, the U.S. Constitution, landmark cases interpreting the Constitution, the nature of the Union, slavery, the Civil War, and the rise of judicial restraints on legislative economic regulation. Offered in alternate years.

158. Constitutional Development II

Historical survey from 1890 to the present. The 1900s' judicial restraint on economic regulation, the Constitution in two world wars, judicial approval of the New Deal, and the Court's modern protection of civil liberties. Political Science 158 may be taken before 157. Offered in alternate years.

159. Current Constitutional Law I

Present constitutional law of the seven articles of the original Constitution. Organization and powers of Congress, the

§Course included in Ethnic Studies program ‡Course included in Women's Studies program

presidency, the courts, interstate relationships, and the amending process. Instruction in use of legal research sources. Offered in alternate years.

160. Current Constitutional Law II

Present constitutional law of the 26 amendments to the Constitution. Rights of free speech, free press, freedom of religion, no establishment of religion, criminal justice, voting rights, due process of law, protection of life, liberty, and property, and equality before the law. Instruction in use of legal research sources. Political Science 160 may be taken before 159. Offered in alternate years.

162. Urban Politics

Political life of the American city. Special attention to the structures and institutions of urban political power, the historical development of urban social life and politics, urban political cultures, the changing forms of urban political action, ethnic and class communities, the political economy of the contemporary city, and the future of urban planning.

163. State and Metropolitan Politics

Development of state constitutions, federal-state relations, politics and elections, the legislative process, the courts, and county government. Organization and current major problems of state administrative systems.

165. Public Administration

Administration of public policies in terms of broad questions of democratic theory. Organizational theory, public employees, budgetmaking, policy evaluation, and public finance.

166. Special Topics in Public Administration

Various public administration topics, often making use of experts outside the University. Public sector labor relations, public budgeting and finance, administration of county and city government, and public personnel policies.

167. The Making of Public Policy

Processes of government relative to economic and social programs. Resource allocation, distribution of benefits and burdens, and control. Political choices among alternative policies in energy use, incomes policy, educational resources, health needs and costs, housing and transportation, the means of policy formation, the planning process, and administrative programming.

168. Special Topics in Public Policy

Selected topics and problems in public policy.

169. Political Behavior

Emphasis on exploring characteristics of the U.S. electorate, with special attention to analyzing factors that prompt individuals to vote in particular ways. Techniques of quantitative political analysis. Computerized manipulation of survey research data.

Senior Course Work

183. Seminar in Comparative Politics

Selected topics in comparative politics in various states and regions.

184, 185. Seminar in American Politics

Selected topics and problems in the American political process.

190. Seminar in Research Methods

Planning and conduct of political science research on selected topics such as political communication and socialization.

191. Seminar in Political Theory

Analysis of selected political philosophers or particular themes in political philosophy.

192. Seminar in Political Theory

Discussion and analysis of the relationship between politics and aesthetics. Special emphasis on the aesthetic theories of Kant, the Dadaists, the Socialist Realists, and Herbert Marcuse.

193. Seminar in World Revolutionary Forces

Theories of revolution that deal with the psychological, social, and political aspects of change. Studies of revolutionary movements and societies.

196. Seminar in International Relations

Selected aspects of international political behavior.

197. Seminar in Civil Liberties

Students do an in-depth study in a particular civil liberty of their choice.

198.01, 198.02, 198.03. Practica in Public Affairs

Directed internships in government agencies, legislative bodies, political parties, or interest groups. Open to qualified juniors or seniors with permission of the instructor.

199. Directed Reading

Independent study. Intensive work in areas not fully covered in upper-division courses. Written outline of the proposed course, with signatures of the sponsoring instructor, department chair, and dean of the College approving the course, must be submitted to the Office of the Dean at least one week prior to registration. The student's copy of the approved form must be presented at the time the student registers. Forms are available at the Registrar's Office.

COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF PSYCHOLOGY

Professors: Marvin L. Schroth, Eleanor W. Willemsen *(Chair)*
Associate Professors: Jerry M. Burger, Roland C. Lowe, Robert Numan
Assistant Professors: Karen M. Anderson, Gerdenio M. Manuel, S.J., Michelle L. Millis

Psychology is the study of behavior, emotion, and thought using techniques modeled on the scientific method. At the undergraduate level, the study of psychology is part of a liberal education; a major in psychology lays the groundwork for advanced studies of many different kinds, including the pursuit of the doctoral degree needed for the professional practice of psychology. The department offers introductory courses in each major area of the discipline, an academic minor, and laboratory courses in psychological methods.

REQUIREMENTS FOR MAJOR

Students majoring in psychology must fulfill the University and College requirements and they must satisfactorily complete the following courses:

Lower-Division Courses in Psychology

1. Psychology 10, 11, and 40

Lower-Division Courses Outside of Psychology (3 courses)

1. Mathematics 6 and 7 (Mathematical Analysis for Social Science I and II) or 11 and 12 (Calculus and Analytical Geometry I and II)
2. Biology 9 (Human Biology)

Upper-Division Courses in Psychology (8 courses)

1. Psychology 110 or 111
2. Seven additional upper-division psychology courses to include:
   a. Two courses related to Psychology 10 (Psychology as a Natural Science) from among 112, 120, 130, 131, and 165
   b. Two courses related to Psychology 11 (Psychology as a Social Science) from among 115, 145, 150, 160, and 185
   c. Three additional elective upper-division psychology courses

SPECIAL PROGRAMS

Emphasis in Special Education or Teaching

Psychology majors who wish to go into special education or elementary teaching must satisfy the Bachelor of Science and departmental requirements and complete a liberal studies program in accordance with current state requirements. Interested students must submit a formal proposal to Dr. Willemsen and the University's adviser for teacher credentials prior to or early in the junior year.

Emphasis in Psychobiology

In addition to the Bachelor of Science and departmental requirements, students who wish to study neuroscience may elect the psychobiology concentration. The following list of requirements incorporates the psychology major:

1. Mathematics 11 and 12 (Calculus and Analytical Geometry I and II)
2. Chemistry 5 and 8 (General Chemistry I and II) and 35 and 36 (Organic Chemistry I and II)
3. Biology 20 (Cell/Animal Structure and Function), 22 (Reproduction and Animal Diversity), 34 (Cell Biochemistry and Physiology), 101 (Vertebrate Anatomy), and 124 (Animal Physiology)
4. Psychology 10, 11, 40 ,110, 130, 165; two courses from 115, 150, 160, 166, and 185; and three additional elective, upper-division psychology courses

Emphasis in Gerontology

Students who wish to study the elderly may select this emphasis. In addition to the Bachelor of Science and departmental requirements, they must take Biology 187 (Biology of Aging), a Practicum in Aging, and at least three courses

selected from the following: Anthropology 172 (Anthropology of Aging), Political Science 149 (Comparative Political Systems), Psychology 188, Psychology 196, and Sociology 172 (Sociology of Aging).

Emphasis in Professional Psychology (Honors)

The Department of Psychology provides a special program for students demonstrating exceptional scholastic promise and the desire to continue with psychology in graduate school. For those students the department recommends the following courses:

1. Psychology 105, 110, 120, and 170
2. Attendance at special departmental seminars
3. Participation in ongoing faculty research
4. An independent research project in the senior year
5. Related courses in other departments selected in consultation with the student's adviser

LOWER-DIVISION COURSES

5.77. Honors Colloquium

Restricted to students in the University Honors Program. This course is the Honors version of Psychology 10. Available only in alternate years.

6.77. Honors Colloquium

Restricted to students in the University Honors Program. This course is the Honors version of Psychology 11. Available only in alternate years.

10. Psychology as a Natural Science

Scientific study of human and animal behavior, including the physiological basis of behavior, perception, learning, motivation, and emotion. Other possible topics include memory, language, and problem solving.

11. Psychology as a Social Science

Principles of human development, intelligence, abilities, personality, psychological measurement, and sociopsychological influences on behavior. Introductory exposure to research methodology and statistical techniques.

36. Gender in Human Development‡

Focuses on the ways in which societal phenomena related to gender (sex roles, sex prejudice) interact with intrapsychic phenomena related to gender (gender identity, masculinity, femininity) and influence individual development through the life span. Topics include children's acquisition of gender identity, masculinity and femininity in personality, women's career development, marriage and divorce, parenting, schools and sex roles, mental health and sex roles, and aging and sex roles.

40. Statistical Data Analysis

Exercises designed to teach the skills of statistical data analysis and technical writing in psychology.

50. Psychology of Adjustment

Introduction to the psychology of personal and social adjustment. Personality patterns of the individual in various contexts, such as the family, the school, marriage, the adolescent years, and social relations. Relationship of sex roles to the individual.

‡Course included in Women's Studies program

70. Comparative Animal Behavior

Animal behavior from a naturalistic and empirical viewpoint. Survey of the literature dealing with ethology and comparative psychology. Interaction between instinct (genetically determined fixed behavior patterns) and experience (learning) as determinants of animal behavior. Social behavior, animal communication, aggression, and the evolution of behavior.

80. Child Psychology

Development from birth to puberty. Intended primarily for nonmajors and majors who will not be taking the Psychology 185, 186, 187 sequence. Students may receive credit for 80 or 185, but not for both. *Psychology 10 or 11 recommended.*

85. Human Sexuality

Human sexual behavior. Adult sexual behaviors; biological aspects of sexual behavior; developmental aspects of sexuality, homosexuality, reproduction, sexual deviations, dysfunctions, and therapy. Sexual abuse, and legal and social issues.

UPPER-DIVISION COURSES

105. Statistics and Experimental Design II

Advanced topics in theory and methods of statistical analysis and experimental design. Complex analysis of variance, multiple correlation and regression, factor analysis, and an introduction to nonparametric statistics. *Prerequisite: Psychology 40.*

110. Experimental Psychology

Basic principles and methods of experimental psychology. Emphasis on the experimental method, but other methods (e.g., naturalistic observation) are discussed. Analysis and application of group and single-subject experimental designs. Survey of the learning, and sensation and perception, literature. Application of lecture material in the laboratory: the conduct of a number of experiments using human and animal subjects. Lectures and laboratory. *Prerequisites: Psychology 10 or 11 and 40.*

111. Research Methods in Psychology

Investigation of methods of psychological research and issues involved in the collection of data. Emphasis on the social, personality, and developmental areas of psychology. Laboratory portion of the course requires designing research projects, collecting data, and writing professional reports. *Prerequisites: Psychology 10 or 11 and 40.*

112. Motivation and Emotions

Scientific study of the various motivational-emotional processes of man and higher animals. Biological drives, psychological survival needs, altered states of consciousness, social motives, and theories of emotion. *Prerequisite: Psychology 10.*

115. Introduction to Abnormal Psychology

Comprehensive consideration of the major forms of mental disorder with regard to their etiology, nature, development, and therapy. Emphasis on current theories of mental dysfunction and the psychology of abnormal thinking. *Prerequisite: Psychology 10 or 11.*

117. Health Psychology

Ways in which principles of psychology can be employed to help medical patients. Psychosocial factors influencing the disease process. Application of learning, cognitive, and motivational principles to health care delivery, prevention of disease, and attainment of wellness. Available only in alternate years. *Prerequisite: Psychology 10 or 11.*

118. Advanced Topics in Clinical/ Abnormal Psychology

For a small number of students who have taken 115 or 117 and wish to study major

mental illness and its treatment in depth. Topics include disease prevention, community care, diagnosis, assessment, multimodal treatment, etc. Three hours per week of volunteer clinical work required. *Prerequisite: permission of instructor.*

120. Perception

The study of how information from the sense organs is transformed into meaningful experiences.

130. Psychology of Learning and Thought Processes

Survey of the experimental literature on the basic forms of the learning process from animals to mankind. Latest theories on memory and thought processes. *Prerequisite: Psychology 10.*

131. Cognitive Psychology

The information-processing approach to how we pay attention to, perceive, remember, discuss, and think about the world around us. The course covers the history of the discipline and the following research areas: consciousness and attention, perception, memory, psycholinguistics, and problem solving. Emphasis on the experimental methods that have been developed to study cognition.

132. Advanced Cognitive Psychology Seminar

Topics include subjects largely determined by students' interests. Discussion of memory in early childhood, in primitive people, and in victims of Alzheimer's disease. Students required to research, present, and discuss topics in an informal setting.

145. Clinical Assessment

Principles and problems of measurement in psychology, i.e., tests of attitudes, aptitudes, and personality. Students construct, administer, score, interpret, and evaluate tests. Interviewing and counseling skills. *Prerequisites: Psychology 11, 40, and permission of instructor.*

150. Social Psychology

The scientific investigation of social behavior. Topics include communication, attraction, person perception, attitude change, aggression, altruism, and group behavior. *Prerequisite: Psychology 10 or 11.* Credit cannot be given if Sociology 125 has been taken.

151. Seminar in Social Psychology

Small-group class. Special topics in social psychology. Research and reading of current literature. Articles dealing with current theoretical and methodological issues in social psychology. *Prerequisite: Psychology 150.* Available only occasionally.

154. Psychology of Language

Examination of the mental processes involved in using language, the behaviorist and neobehaviorist accounts of language, the linguists' strong reaction against these explanations, and the information-theory approach to the study of language. Topics include the biological foundations of language, human language vs. animal communication, the perception and production of speech sounds, the representation of words and concepts in memory, the syntax and meaning of sentences, the development of language in children, language comprehension, and the relationship between language and thought.

157. Organizational Psychology

Effects of organizational structure on individual and group behavior. Principles of behavior that may be applied to various large organizations, such as corporations, universities, and hospitals. Job satisfaction, group decision-making, power, leadership, and communication. *Prerequisite: Psychology 10 or 11.*

160. Theories of Personality

Critical analysis of major theories of personality. Emphasis on therapeutic and research implication. Considerable attention to the development of theory construction and analysis skills. Theories of

Freud, Jung, Adler, Rogers, Sullivan, Kelly, Bandura, and others. *Prerequisite: Psychology 11.*

161. Advanced Topics in Personality

For advanced students interested in pursuing specific topics in personality, e.g., consciousness, personality development, anxiety, frustration, aggression, and psychoanalytic psychology. *Prerequisite: Psychology 160.* Available only occasionally.

165. Physiological Psychology

Emphasis on the neuroanatomical, neurochemical, and neurophysiological correlates of motivation, emotion, learning, and memory. Neural regulation of sleep and arousal, mechanisms of drug action, and neuropathology. Brain anatomy and application of physiological techniques to the study of animal behavior. Lectures and laboratory. *Prerequisite: Psychology 10.*

166. Human Neuropsychology

The study of human brain function from a clinical and an experimental perspective. Students presented with a general view of brain organization and function and then introduced to the neurological exam and clinical tests. Subsequent topics include principles of cerebral asymmetry; functions of the frontal lobes; psychiatric disorders; and brain mechanisms involved in emotion, spatial behavior, memory, and language. *Prerequisite: Psychology 10.*

170. History and Systems of Psychology

Origin and development of modern psychological approaches. Psychoanalysis, behaviorism, Gestalt, humanism, and existentialism. Emphasis on conceptual issues.

175. Humanistic Psychology

Historical and conceptual roots of humanism. Implication of the "third force" for therapy, community living, education, and research. Special attention to humanistic psychotherapies and the application of humanistic principles to education. Three hours per week of community volunteer work required.

182. Seminar in the Psychology of Motivation

Series of assigned readings and reports from classic and contemporary sources in the experimental and theoretical literature on motivation. Investigation of special problems. *Prerequisite: Psychology 112 or special permission.* NCX†

184. Seminar in the Psychology of Learning

Series of assigned readings and reports from classic and contemporary sources in the experimental and theoretical literature on learning and thinking. NCX†

185. Developmental Psychology I

First course in a sequence of courses that explore the development of individuals during the life cycle. Topics for the year course include (1) principles and theories of development; (2) perceptual, cognitive, social, and personality development; (3) family, school, and other societal influences on development; and (4) applied issues in child rearing, education, and other socialization practices. Students have an opportunity to clarify their own values about having and raising children and about the responsibilities of society in general to children. Organized on an age-stage basis. Developmental principles, prenatal development, infancy, and the toddler period. *Prerequisite: Psychology 10 or 11.*

186. Developmental Psychology II

Continuation of Psychology 185. Early and middle childhood years, i.e., approximately ages 4 through 11. Special attention to intelligence, schools, sex roles,

†Exempted from challenge

achievement, and prejudice. *Prerequisites: Psychology 10 or 11 and either Psychology 80 or 185.*

187. Developmental Psychology III

Continuation of Psychology 186. Puberty through early adulthood. Intellectual development, identity, sexuality, moral development, values classification, and the capacity of humans to change. *Prerequisites: Psychology 10 or 11 and either Psychology 80, 185, or 186.*

188. Adult Development Seminar

Limited enrollment. Young adulthood through middle age. Stages and transitions in adult life, the concept of life crisis, and the interplay of situations and personality. Commitment and choice. Part of gerontology emphasis. *Prerequisite: Psychology 11.* Available only occasionally.

189. Developmental Psychology Seminar

Small-enrollment discussion class for psychology majors. Readings from the original theoretical and empirical journal literature on some topic area from developmental psychology. Topics vary from year to year. All students prepare research proposals as term projects. *Prerequisites: Psychology 185, 186, or 187 and permission of the instructor.* Available only occasionally.

196. Psychology of Aging

Changes in individual lives that come with aging. Consideration of changes within the person and those occurring in the life situation. Special attention to mental health institutionalization and stresses facing the aged. *Prerequisite: Psychology 10 or 11.*

197. Advanced Seminar

Intensive focus on selected specialized topics, which vary from year to year. *Prerequisite: permission of instructor.* NCX†

198. Internship/Practicum

Clinical experience in community agencies. Selected readings. Open to upper-division students with average GPA of 3.0 or better, who have received permission of a faculty sponsor.

199. Directed Reading/Directed Research

Independent projects undertaken by upper-division students with a faculty sponsor. To receive course credit for such research, the student must submit a formal written proposal and have it approved by the sponsoring faculty member, the department chair, and the dean. The proposal must be submitted before the end of the previous quarter and it must meet University requirements for independent study credit (available from the department chair or dean).

†Exempted from challenge

COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF RELIGIOUS STUDIES

Professors: Joseph A. Grassi, Theodore J. Mackin, S.J.
Associate Professors: Martin L. Cook, Anne Marie Mongoven, O.P., Frederick J. Parrella, James W. Reites, S.J., Philip Boo Riley *(Acting Chair),* Francis R. Smith, S.J.
Assistant Professors: Catherine M. Bell, Paul G. Crowley, S.J., Michael J. Hollerich, Dwight N. Hopkins, John David Pleins, Steven A. Privett, S.J., James E. Sweeters
Acting Assistant Professor: Joyce Scannell
Lecturers: Rita Claire Dorner, O.P., Donald D. St. Louis, Salvatore A. Tassone, S.J., Tennant C. Wright, S.J.
John Nobili, S.J., Professor: Theodore J. Mackin, S.J.
Distinguished Bannan Professor: John A. Coleman, S.J.

The Department of Religious Studies offers courses as part of the University Curriculum and offers a major program for those who wish to concentrate in the study of religion and theology. An academic minor is also available. The department's aim is to enable students to investigate and examine their lives, their world, and their education in light of religious traditions.

Because of the University's commitment to examine diverse religious traditions, the Department of Religious Studies offers a wide range of courses; and because of the University's commitment to the Catholic tradition, the department offers a special opportunity for students to pursue and examine Catholicism in an academic context.

REQUIREMENTS FOR MAJOR

Requirements in Arts and Sciences

In addition to the University and College requirements for the Bachelor of Arts degree (pages 31–33), the following are specific for students completing the major in religious studies:

Philosophy Two courses. The three-course Western Culture sequence (Philosophy 11, 12, 13) fulfills this requirement.

History Two courses. The department prefers that these be in the Western Civilization series (History 11, 12, 13).

Fine Arts Two courses selected from among those offered by the departments of Art, Music, and Theatre and Dance. The three-course Art History sequence (Art History 11, 12, 13) fulfills this requirement.

Requirements in Religious Studies

Lower Division In consultation with their academic adviser, students are to select four lower-division courses from among each of the three areas of scripture, systematic theology, and cross-cultural religious studies.

Upper Division In consultation with their academic adviser, students are to select eight upper-division courses in religious studies. One of the eight required courses must be Religious Studies 199 (Directed Reading and Research). Five of the courses must be selected from among the religious studies seminar courses for majors that are offered each quarter. These seminars consist of a six-course sequence offered on a two-year cycle. The required seminar courses include two courses in systematic theology, one each in scripture, religion and society, religious ethics, and the history and method of theology.

Senior Research Paper All religious studies majors are required to submit a project during their senior year. The project will be completed in conjunction with the Directed Reading and Research course and will be supervised by the faculty directing this course.

Biblical Languages Koine Greek, Biblical Hebrew, and Biblical Aramaic are taught in the Classics Department. These languages are recommended for students who intend to do graduate studies in scripture.

GRADUATE PROGRAM

The Religious Studies Department also offers a program leading to a master's degree in three areas: catechetics, pastoral liturgy, and spirituality. For more information, see the departmental graduate program brochure.

INTRODUCTORY-LEVEL COURSES

1. Introduction to Religious Studies

Study of the ways in which men and women have been religious. Reflections on the contemporary ways of being religious, especially in light of religious pluralism and secularism.

2. The Old Testament and Its World

Survey of the historical and religious traditions of ancient Israel. Attention given to the archaeology of Syro-Palestine. Emphasis on the role of the Old Testament in Judaism, Christianity, and Islam.

3. Introduction to the New Testament

Formation of the New Testament literature in the first generations of the Christian community. Interpretation of the literary forms used by the community. Examination of the form and principal content of primitive belief and worship.

4. Introduction to Christian Tradition

Survey of the history and development of the Christian tradition from the New Testament to contemporary American Christianity.

5. Introduction to Catholic Theology

Introduction to the themes and methods of Catholic theology. Emphasis on scripture and tradition in light of contemporary issues.

INTERMEDIATE-LEVEL COURSES

53. Christianity and World Religions

Religious pluralism as understood primarily in Judeo-Christian tradition. Revelation, authority, truth, and intra-religious dialogue. Analysis of religious truth claims.

55. Theology and Ethics of Thomas Aquinas

An introduction to the life, thought, and ethics of Aquinas. Basic topics to be discussed include the existence of God, human nature, and human participation in society.

57. Faith, Justice, and Poverty

Foundations for a Christian response to poverty. Liberation theology, social justice, and the relation of economics to religion.

58. The Contemporary Church

The contemporary Christian (and more specifically Roman Catholic) Church. New Testament, Church documents since the Second Vatican Council, and some contemporary fiction that treats aspects of the Church.

59. Bible in Jewish Tradition

Historical-critical school of interpretation of the Bible and traditional rabbinical interpretation. Origins and history of the Jews as revealed in their sacred writings.

60. Christian Ethics

Dynamics of Christian conduct and of the moral implications of the Christian commitment. Formulation of the principles of a Christian ethic, their application to selected areas of moral conduct in contemporary life, e.g., to wealth and poverty, violence and nonviolence, war and peace, and interpersonal relations.

63. Biblical Drama

Creative drama techniques including mime, role playing, improvisation, psychodrama, and story dramatization are used as tools for exploring and unlocking the riches of biblical stories.

64. Christ in the Four Gospels

Formation of the gospels and the individual portrait and interpretation of Jesus by each of the evangelists. Historical ministry of Jesus. Comparison of the Christologies in each of the four gospels.

65. Christ in the Christian Tradition

Selective theological interpretations of Jesus Christ, from biblical literature, the history of Christian doctrine, and modern theological scholarship. The humanity and divinity of Jesus.

66. The Pauline Letters

Letters attributed to Pauline authorship. Analysis of the Pauline theology.

67. The Synoptic Gospels

History of the formation and literary forms of the Synoptic Gospels. Analysis of salvation history as contained in these sources and in the historical ministry of Jesus.

70. Psychology and Religion

Meaning and function of religion in human life cycle. Psychological research on religious experience, mysticism, and altered states of consciousness. Meaning of symbols, myths, and dreams. Focus on Freud, Jung, Erikson. Lecture, discussion, films.

71. The Theology of C. S. Lewis

Religious writings of C. S. Lewis. Lewis's approach to religious truth and his major theological themes.

72. Women in the Biblical Traditions‡

Attitudes toward women and roles of women in Christianity and Judaism. Old Testament and New Testament perspectives on women in religion, family, and social structure. The contemporary feminist challenge to Judaism and Christianity. Views of the Christian church regarding sexuality and women's ordination.

73. New American Religions

Contemporary American religious movements; a critical review of their beliefs and practices. Among those studied are Divine Light Mission, Hare Krishna Movement, witchcraft, and satanism, as well as a number of other groups.

75. Meditation

Study and practice of meditation. Daily meditation. No lectures. Class discussion, weekly brief essays.

76. Hinduism and Buddhism

Exploration of the historical development, symbols, rituals, scriptures, and institutions of Hinduism and Theravada Buddhism in South and Southeast Asia. Brief look at Tibet. Focus on the social world of these traditions and their interaction with a variety of Asian cultures.

77. Chinese and Japanese Religions

Exploration of the historical development, doctrines, institutions, and literature of the religions of China and Japan, including Confucianism, Taoism, Shinto, Mahayana Buddhism, and recent sects. Brief look at Korea. Focus on the social world of these traditions in the cultural variety of East Asia.

78. Christian Liturgy

Appreciation of the structure and rhythm of liturgical worship and of its function as Christian celebration in such ceremonies as the Mass, the Sacraments of Initiation, etc. Emphasis on content and the learning of liturgy by putting together liturgical celebrations.

80. Religious Symbolism and Myth

Introduction to the meaning and function of symbol and ritual in human life and in Christian worship. Symbolic ritual actions of the Church (sacraments). Questions such as (1) how do symbol and ritual express and shape human life, and (2) how do sacraments express and shape the identity of Christians as church.

81. Theology of the Sacraments

Analysis of the work of Christ as sacrament of God the Father, of the Church as the sacrament of Christ, and of baptism, confirmation, reconciliation, healing, the Eucharist, marriage, and Orders as the principal sacramental actions of the Church. Origins in the scriptures. Traditional theological interpretations.

82. Theology of Nonviolence

Nonviolence not only as an instrument of social change but as a way of life resulting from the Christian commitment.

83. Christian Eschatology

Ultimate hopes of the Christian faith. Classical Christian symbols of judgment, heaven, hell, purgatory, and the movement of history to the Reign of God.

84. Great Christian Mysteries

Central Christian mysteries of Christ, God, the Trinity, grace, sin, redemption, man, and human destiny from a biblical and historical point of view.

‡Course included in Women's Studies program

86. The Old Testament as Literature

Explores the variety of Old Testament literature: sagas and legends, royal history, love poetry and hymns, wisdom teaching. Examines the narrative and poetic technique of biblical writers as well as their values and ideals. Comparison with ancient Near Eastern literature.

91. Slave Narratives§

A creative engagement with one of the most untapped American religious resources—black American slave narratives during the pre-Civil War period. The religious dimensions of slave families, laughter, folklore, conversions, music, and other cultural/political issues.

92. The Protestant Tradition

Origins and development. Protestant thought and Protestant ecclesiastical institutions. Special attention to American Protestant Christianity and its impact on American political and social life.

95. History of Christianity I

A survey of the Christian church from its beginnings to the end of the Middle Ages. Emphasis on authority and discipline in the church, dissent and orthodoxy, patterns of religious life, and the relationship of church and state.

96. History of Christianity II

A survey of developments from the Reformation to the twentieth century. Focus on the division in the Christian churches since the Reformation and the attempts of the churches to cope with secularization and modernity. Emphasis on post-Enlightenment developments in the Catholic Church.

ADVANCED-LEVEL COURSES

101. Liberation Theology

Latin American, African, Asian, and feminist theologies of liberation. Assessment of the impact of these theologies of liberation on such issues as ecclesiology, method in theology, Christology, biblical interpretation, and spirituality, as well as the implications of liberation theology for North Americans.

103. Law and Justice: Jewish, Christian, and Islamic Perspectives

The legal system and social ethics of ancient Israel with special emphasis on the concern for social justice in the prophetic literature of the Hebrew Bible. Explores early rabbinic law. Emphasis on social justice themes in Third World liberation theology. Consideration of modern Middle East issues.

104. Scripture, Canon, and Community

Textual aspects of major religious traditions, comparing roles of "scripture" and "canon" in social and theological development of a tradition. Introduces students to basic texts of Buddhism, Hinduism, Judaism, and Islam and to major issues in the analysis of religious institutions and literate religious cultures.

105. Messiahs and the Millennium

A comparative exploration of apocalyptic movements and models of socio-religious change in American UFO cults, Japanese "new" religions, South Pacific cargo cults, and early Christianity.

111. Afterlife as a Theological Concept

Biblical, Jewish, Christian, Eastern, humanistic, and psychic claims about the nature of death and the possibility and

§Course included in Ethnic Studies program

ature of an afterlife. Modern philosophi-
al assessments of the cogency of those
laims. Relation (or nonrelation) between
belief in an afterlife and meaningful
uman existence.

15. Science, Technology, and Ethics

nvestigation of the religious and ethical
ignificance of the impact of technology
n society. Analysis of ethical issues in
cientific and engineering practice.

19. The Papacy as History and Idea

urvey of the origins and development of
oman Catholicism's peculiar institu-
ion. Focus on the papacy's emerging self-
onsciousness and on reception of its
laims and policies, concluding with a
nodern theological assessment. Lectures
lus reading and discussion of primary
exts.

22. The Person of Christ in the New Testament

esus' understanding of himself and his
nission and their interpretation by New
estament writers. Different major
hristologies of the New Testament
howing the unity and diversity of their
nterpretation of Christ.

24. Technology and Its Religious Critics

nvestigation of religious dimensions of a
ariety of criticisms of technology. Analy-
is of historical and social dimensions of
echnology.

26. Black Theology in the U.S.§

A critical assessment of black theology of
iberation as it has developed from the
960s in the United States, including the
lemands of black women. Why a black
heology? How does it challenge our own
eligious and theological perspectives?

36. The Bible and Social Ethics

rophetic tradition of the Old and New
estaments. Special emphasis on biblical
justice and love and their meaning in
today's society.

138. Medical Ethics

Introduction to the major issues in biomedical ethics. Basic principles of biomedical ethics, genetic interventions and reproductive technologies, life and death, abortion, informed consent, euthanasia, patients' rights, professional responsibilities, and confidentiality.

139. Ethics and Politics

History of the institutional relationship between church and state. Various forms of the cultural interaction between politics and religion. Particular emphasis on Anglo-American modes of separating and relating church and state, religion, and politics. Impact of Protestant and Catholic, liberal and conservative, reactions to the American experience.

140. Ethics and Warfare

Historical and contemporary approaches to the ethical issues that arise in warfare. History of the development of Christian thought on war. Applicability of that thought to modern technological war evaluated.

141. Religious Autobiography

Selected Christian autobiographies from St. Paul to Dag Hammarskjold.

142. Christian Mysticism

Selected writers in the contemplative and mystical traditions of Western mysticism.

146. The Christian Experience of God

Nature of religious experience. Emphasis on how the Christian community expresses or symbolizes its experience of God in creed, doctrine, and liturgy.

147. Zen Buddhism

History and theory of Zen Buddhism. Some practice of Zen meditation. No

§ Course included in Ethnic Studies program

lectures. Class discussion, frequent brief essays.

149. The Theology of Marriage

Christian marriage understood from the scriptures, recent Catholic writing, and a humane psychology of the human person. Survey of Roman Catholic canon law on marriage.

150. Luke—Acts

The gospel according to Luke and the Acts of the Apostles as a unified document with special emphasis on its sources, message, and theology.

151. The Johannine Writings

Fourth gospel, the Johannine letters, and the Apocalypse: their vocabulary, imagery, and theological concerns.

156. Belief and Unbelief

Challenges and responses to belief in the modern era. Primary texts. Problem of evil, religious projection, and the basis in experience of religious assertions.

157. God in Contemporary Thought

The question of God's existence and nature in the writings of contemporary thinkers.

159. Religion in the Theories of Freud and Jung

Meaning, origins, and function of religion in human life according to Freud and Jung. View of human nature; religious belief and symbol; relationship among religion, culture, and personality. Influence of biographical factors on Freud's and Jung's theories of religion. Lecture, discussion, films.

167. Theology in the Daily News

Study of current events in the light of religious tradition. No lectures. Class discussion, frequent brief essays. *Prerequisite: a course in scriptural theology.*

168. Women's Religious Roles‡

The participation of women in religion (Hinduism, Islam, Judaism, and East Asia) as shaped by notions of female purity and pollution. The role of such beliefs within religious communities. Marriage, sexual segregation, menstruation, motherhood, monasticism, and shamanism.

172. Contemporary Judaism

Judaism in the twentieth century in terms of its principal cultural and social influences, its religious forms, and theological teaching. (This course is partially funded by the Jewish Chautauqua Society.)

173. Faith and the Holocaust

History of the Nazi attempt to totally exterminate the Jews, the enormity of this evil, and the problems it might pose for faith.

179. Aspects of Jewish History

Jewish history as both the story of a people and an account of a tradition of ideas. Exploration of the development of the Jewish people through a close examination of their history and how it has affected their religion and thought.

185. Literature and Theology

Significant literature from various ages and cultures: its theological content and relevance for the contemporary student.

187. Ancient Greek and Roman Religion

Pagan religious culture in the Classical Mediterranean world. Consideration of the differing religious attitudes and expectations of polytheisms and monotheisms, and of religious expression in the context of cult and ritual. (Also listed as Classics 185.)

188. Religious Studies Seminar

‡Course included in Women's Studies program

192. Special Questions in Religious Studies

194. Ecumenism

The movement toward closer relationships among world religions.

198. Practicum in Religious Studies

Teaching or religious work, special reading, and theological reflection under the guidance of the department faculty. Restricted to majors in religious studies.

199. Directed Readings and Research in Religious Studies

For religious studies majors only.

COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF THEATRE AND DANCE

Associate Professors: William R. James, Frederick P. Tollini, S.J. *(Chair)*
Assistant Professors: Jagienka A. Drweski, Jerald R. Enos, CSC
Senior Lecturer: Albert L. Gibson
Lecturers: Barbara A. Murray, William J. Nichols, Sheldon Ossosky, Carolyn Silberman
Frank Sinatra Professor: Henry Mollicone

The Department of Theatre and Dance provides course work leading to the Bachelor of Arts degree and produces a number of plays each year in the Louis B. Mayer Theatre and the Fess Parker Studio Theatre.

Theatre arts and dance majors must fulfill the University and College requirements for the Bachelor of Arts degree. In addition, candidates for the B.A. must complete the requirements in their selected area of emphasis.

DEGREE PROGRAMS

The department offers two distinct programs: Theatre Arts and Dance. Each area provides the opportunity for a broad education and also for specialized training. A student may pursue either program with several goals in mind: as part of an undergraduate liberal arts education; as preparation for graduate studies in theatre and dance; as preparation for further studies in arts administration, business, law, and teaching; as pre-professional training for certain areas of theatre and the performing arts.

Theatre Arts Program

The program offers coordinated courses in acting, design, technical production, dramatic literature, and theatre history. Depending on the emphasis chosen by the student, departmental requirements are supplemented by recommended electives to form an integrated program.

Dance Program

Dance majors follow an organized sequence of courses in dance technique choreography, theatrical dance forms, and dance history. Courses are supplemented by classes with professional guest artists.

REQUIREMENTS FOR THE BACHELOR OF ARTS DEGREE IN THEATRE ARTS

Lower Division (6 courses)

1. Theatre and Dance 11, 12, 13 (Western Theatre I, II, III)
2. Theatre and Dance 20 (Beginning Acting I)
3. Theatre and Dance 30 (Basic Stagecraft)
4. Either Theatre and Dance 31 (Basic Costume Construction) or Theatre and Dance 32 (Basic Stage Lighting)

Upper Division (8 courses)

1. One dramatic literature course (Theatre and Dance 110–119)
2. One Shakespeare course (Theatre and Dance 116, 117, or 118)
3. Theatre and Dance 171 (Playscript Analysis)
4. Five theatre and dance courses related to area of emphasis

Lower or Upper Division

1. Two quarter units of Theatre and Dance 39 or 139 (Production Workshop)

Performance opportunities include departmental productions (five or six each year), course-related presentations, and student recitals.

REQUIREMENTS FOR THE BACHELOR OF ARTS DEGREE IN DANCE

Lower Division (24 units)

1. Theatre and Dance 10 (Introduction to Theatre Arts)
2. Theatre and Dance 20 (Beginning Acting I) or 24 (Basic Acting for Nonmajors)
3. Theatre and Dance 31 (Basic Costume Construction) or 32 (Basic Stage Lighting)
4. Theatre and Dance 40, 41, or 42 (Basic Jazz Dance I, II, or III)
5. Theatre and Dance 43 and 44 (Basic Ballet I and II) or 45 (Basic Ballet III)
6. Theatre and Dance 46 and 47 (Modern Dance I and II) or 48 (Modern Dance III)
7. Theatre and Dance 49 (Basic Dance Composition)

Upper Division (8 courses)

1. Theatre and Dance 140 and 141 (Advanced Ballet I and II)
2. Theatre and Dance 142 (Advanced Jazz Dance)
3. Theatre and Dance 143 (Choreography)
4. Theatre and Dance 144 (Dance History)
5. Theatre and Dance 146 and 147 (Advanced Modern Dance I and II)
6. Theatre and Dance 199 (Dance Recital)

Lower or Upper Division

1. Two quarter units of Theatre and Dance 39 or 139 (Production Workshop)

An eight-course theatre arts minor and a 36-unit dance minor are available. Consult the Theatre and Dance Department for information.

Performance opportunities in dance include the Choreographers' Gallery, the annual dance concert in Mayer Theatre, student recitals, informal concerts, and combined performances with the Theatre Arts program in musicals and stage plays. Independent study may include courses in the University's post-mastectomy rehabilitation Dance Is Therapy program.

THEATRE PRODUCTION PROGRAM

The theatrical season at the Louis B. Mayer and Fess Parker Studio theatres usually includes at least four faculty-directed plays, one or two student-directed plays, the major dance concert, and several related events. Performances by guest artists and theatrical companies are frequently sponsored by the Department of Theatre and Dance.

Active participation in these productions is open to all members of the University community. Though the plays are an essential part of the theatre and dance major, they are also an opportunity for other students and faculty to work in theatrical production. Mayer Theatre productions often include the appearance of a professional guest artist, actor, or director.

Besides the regular season, the Department of Theatre and Dance sponsors a summer season called Theatre Santa Clara Summerfest. This summer festival employs professional, student, and amateur actors, dancers, technicians, and apprentices. Guest productions combine with those of the Theatre and Dance Department to offer a series of dance concerts, dramas, children's theatre, and musical comedy. College credit and some salaried positions are available through the Summerfest.

COMBINED PROGRAMS IN THEATRE AND TELEVISION

Students wishing to pursue combined studies in theatre and television should consult the chair of the Theatre and Dance Department or the Communication Department for requirements and curriculum models.

LOWER-DIVISION COURSES

10. Introduction to Theatre Arts

Basic theatrical skills and processes leading to production and performance. Fulfills visual and performing arts requirement for non-theatre and dance majors.

11. Western Theatre I

Historical survey of Western theatre and dramatic literature. Ancient Greece, Rome, medieval world, Italian Renaissance.

12. Western Theatre II

Elizabethan period; Restoration; seventeenth-century France and Spain; eighteenth-century England, France, Germany, and Italy.

13. Western Theatre III

Nineteenth and twentieth centuries in Western Europe and America.

14. Asian Drama

Classical theatre of Eastern and Central Asia. Theatrical techniques and significant plays of the Noh, Kabuki, and Bunraki Puppet Theatre of Japan; the Peking Opera; the sanscrit and epic drama of India.

20. Beginning Acting I

Improvisation. Theatre games. Role playing. Sensitizing of physical and mental tools. Analysis of skills and problems of individual students.

21. Beginning Acting II

Continuation of 20. Emphasis on scene and monologue study, script analysis. *Prerequisite: Theatre and Dance 20.*

22. Basic Voice and Movement

Development of basic voice and movement skills for actors.

24. Basic Acting for Nonmajors

Basic principles of role playing for those with an interest in the acting process.

25. Drama Workshop

Study and performance of scenes from plays. Application of principles and methods taught in basic acting courses. *Prerequisite: Theatre and Dance 21 or 24, or permission of instructor.* Recommended for majors and nonmajors. (2 units)

26. Summer Theatre

Performance or technical work in six-week summer program and run of production for Theatre Santa Clara Summerfest. (1–10 units)

29. Rehearsal and Performance

Active participation in the preparation and performance of departmental productions as actors, stage managers, assistant stage managers, or assistants to the director. Major design/technical assignments. *Prerequisite: approval of director of production.* May be repeated for a total of 8 units. (2 units)

30. Basic Stagecraft

Principles and techniques of stagecraft. Nomenclature. Handling and construction of scenery. Use of hand and power tools. Blueprint reading.

31. Basic Costume Construction

Introduction to making costumes. Pattern drafting, sewing techniques, fabric studies.

32. Basic Stage Lighting

Principles and practice. Color, instrumentation, basic electricity, and electronics. Elementary design theory and practice.

33. Make-up for Stage

Basic principles of make-up for the stage. Youth, old-age, and special problems. Use of all media. (2 units)

35. Painting for the Stage

The psychology of color and practical application of paint as employed in all areas of scenic and costume design.

39. Production Workshop

Training in development of technical skills for stage production. Directed work in scenery and costume construction, lighting, and sound. May be repeated for a total of 8 units. Not applicable to paid work hours, or to laboratory hours connected with stagecraft courses. (2 units)

40. Basic Jazz Dance I

(2 units)

41. Basic Jazz Dance II

(2 units)

42. Basic Jazz Dance III

(2 units)

43. Basic Ballet I

(2 units)

44. Basic Ballet II

(2 units)

45. Basic Ballet III

(2 units)

46. Modern Dance I

(2 units)

47. Modern Dance II

(2 units)

48. Modern Dance III

(2 units)

49. Basic Dance Composition

Traditional approaches to compositional problems of form and design, time and rhythm, energy flow and force in dance as art form. (2 units)

50. Musical Theatre Workshop

Dance forms, music, and singing related to the American musical theatre. (2 units)

51. Intermediate Acting I

Characterization: principles and techniques of role portrayal in realistic drama. *Prerequisite: Theatre and Dance 21 or equivalent.*

52. Intermediate Acting II

Role development: detailed study of creative method in developing complete roles in realist and naturalist plays. *Prerequisite: Theatre and Dance 51 or equivalent.*

63. Biblical Drama

Scriptural material explored through dramatic techniques.

70. Theatre Graphics

Introduction to graphic representation. Drafting, mechanical perspective, freehand drawing, isometrics.

71. Advanced Stagecraft

Development of advanced skills in metal, woods, and alternative scenic materials. Welding, wood-turning, construction theory, scenic engineering, special materials, and production management. *Prerequisite: Theatre and Dance 30 or equivalent.* Alternate years.

72. Stage Management

Techniques and responsibilities of the backstage administrator. Analysis of preproduction, audition, rehearsal, and performance duties. Methods for controlling personnel, paperwork, and equipment. (2 units)

81. British Comic Drama

Introduction to three centuries of English stage comedy. Forms and interests; literature and spectacle.

86. Chicano Theatre

Study of the nature and performance of the "acto," Hispanic-American theatre's basic form of theatrical expression.

UPPER-DIVISION COURSES

110. Classical Tragedy

See Classics 182.

111. Classical Comedy

See Classics 186.

112. Modern Drama

Continental drama from Ibsen to the present in translation. Alternate years.

113, 114. English Drama I, II

See English 113 and 114.

116. Shakespeare's Tragedies

See English 116.

117. Shakespeare's Comedies

See English 117.

118. Shakespeare's Histories and Sonnets

See English 118.

119. American Drama

Drama in the United States from 1787 to the present. Emphasis on the period after 1920.

120. Greek and Roman Acting Styles

Lecture, demonstration, and practice in acting styles of the Greek and Roman theatre. *Prerequisite: Theatre and Dance 52 or equivalent.* Alternate years.

121. Comedic Acting

Focus on Commedia dell'Arte, Moliere, Restoration period Comedy of Manners. *Prerequisite: Theatre and Dance 52, 120, or equivalent.*

122. Shakespearean Acting

Techniques for performance of Shakespearean and Elizabethan drama. *Prerequisite: Theatre and Dance 52 or equivalent.*

123. Modern Acting

Ensemble work; skills developed through experimental and absurdist drama. *Prerequisite: Theatre and Dance 52, 120, or equivalent.*

124. Acting for Nonmajors II

Continuation of 24. *Prerequisite: Theatre and Dance 24.*

125. Drama Workshop

See Theatre and Dance 25. (2 units)

126. Summer Theatre

See Theatre and Dance 26. (1–10 units)

129. Rehearsal and Performance

See Theatre and Dance 29. (2 units)

132. Lighting Design

Application of lighting skills to production design. *Prerequisite: Theatre and Dance 32 or equivalent.* Alternate years.

133. Scene Design

Application of graphic skills to scenic design. Styles, scene painting technique, set decor. *Prerequisite: Theatre and Dance 70 or equivalent.* Alternate years.

134. History of Fashion I

Study of the influence of social background on structure, style, and the use of clothing in the Western world from ancient times to the seventeenth century. Alternate years.

135. History of Fashion II

Study of the influence of social background on structure, style, and use of clothing in the Western world from the eighteenth century to the present. Alternate years.

136. Graphic Design

Layout, illustration, composition of advertising, media, and poster and program design as applied to the performing arts.

137. Pattern Drafting and Draping for the Stage

Drafting and draping techniques for a basic bodice, skirt, sleeve, and collars and techniques for developing variations. Emphasis on drafting period garments. *Prerequisite: Theatre and Dance 31 or permission of instructor.* Alternate years.

138. Costume Design

Principles of costume design for the stage. Fabrics and special materials. Rendering.

139. Production Workshop

See Theatre and Dance 39.

140. Advanced Ballet I

Prerequisite: permission of instructor.

141. Advanced Ballet II

Prerequisite: permission of instructor.

142. Advanced Jazz Dance

Prerequisite: permission of instructor.

143. Choreography

Improvisation, composition. Theory and principles of dance choreography. *Prerequisite: Theatre and Dance 49 or equivalent.*

144. Dance History

Historical role of dance in society from ancient to modern times. Alternate years.

146. Advanced Modern Dance I

Prerequisite: permission of instructor.

147. Advanced Modern Dance II

Prerequisite: permission of instructor.

148. Advanced Modern Dance III

Prerequisite: permission of instructor.

170. Play Writing

Critical analysis of dramatic structure for the playwright. Scenarios, character studies, writing of original plays. Alternate years.

171. Playscript Analysis

Selected plays. Emphasis on interpreting the script in terms of production values.

172. Theory of Stage Directing

Basic course in the problems, techniques, and theory of directing plays for the live theatre. *Prerequisites: Theatre and Dance 11, 20 or 24, and 171.*

173. Stage Directing Practice

Two-quarter project in directing. A short play fully staged. *Prerequisite: Theatre and Dance 172 or equivalent.*

174. Drama and Criticism

Preparing to be theatre critic: what to expect from a performance, understanding production style, assessing physical production, appraising directing, finding an audience for criticism. Reviewers' privileges and responsibilities.

175. Theatre Administration

Functions and techniques of the producer, business manager, house manager, stage manager, treasurer, and publicist. Alternate years.

186. Special Topics in Drama

Special upper-division topics in dramatic literature. May be repeated for credit as topic varies.

187. Special Topics in Theatre History

Topics vary. Satisfies lower-division theatre history requirement for theatre and dance majors. May be repeated for credit.

191. Seminar in Arts Administration

Multidisciplinary studies (art, music, theatre) in problems of arts administration (cf. Art 191 and Music 191).

198. Practicum

Reserved for projects with recognized institutions outside of the University. Written proposal must be approved by instructor and department chair one week prior to registration.

199. Recital/Creative Projects/ Directed Reading/Directed Research

Three areas of directed study: recital, reserved for seniors in acting and dance; creative projects in directing, choreography, technical production, design, play writing, administration; directed reading and/or research. Written proposal must be approved by the instructor and department chair one week prior to registration.

6

Leavey School of Business and Administration

The Leavey School of Business and Administration offers a professional education emphasizing humanistic and moral development as well as technical proficiency.

The Leavey School of Business and Administration confers a Bachelor of Science in Commerce degree in Accounting, Decision and Information Sciences, Economics, Finance, Marketing, and Organizational Analysis and Management. A minor in business is also available.

REQUIREMENTS FOR MAJOR: BACHELOR OF SCIENCE IN COMMERCE

The program of study for the degree of Bachelor of Science in Commerce, which consists of a total of 175 quarter units, includes courses that fulfill the goals of the University Curriculum, the School of Business and Administration curriculum, and the respective departmental major curriculum.

For the Bachelor of Science degree, students must fulfill the following University and College requirements:

Composition and Literature

Three courses: (a) two courses in composition and rhetoric, normally English 1 and 2; and (b) one course in writing or in literature that includes a writing component. This course should preferably be taken after completing 60 quarter units.

Western Culture

Two courses in one of the following sequences: (a) English 11, 12, and 13; or (b) History 11, 12, and 13; or (c) Philosophy 11, 12, and 13; or (d) Art History 11, 12, and 13. The two courses in Western Culture should normally be taken in sequence.

Foreign Language

Successful completion of the second course of the first-year sequence in a single classical or modern language. Students who have successfully completed

three years of study in a single classical or modern foreign language during high school or who demonstrate an equivalent level of proficiency by passing a language proficiency examination are exempt from the requirement.

Social Sciences

Two courses: Economics 1 and 2 (Principles of Economics I and II)

Mathematics and Natural Sciences

Two courses: Mathematics 11 and 12 (Calculus and Analytic Geometry I and II)

Ethics

One course in general or applied ethics from the ethics offerings in the Department of Philosophy

Religious Studies

Three courses: (a) two courses, normally taken during the freshman and sophomore years–one Introductory-Level Religious Studies course and one Intermediate-Level Religious Studies course; and (b) one Advanced-Level Religious Studies course taken after completing 88 quarter units. These courses are to be taken in sequence.

Accounting

Three courses: Accounting 1, 2, and 3

Computer Science

One course selected from Decision and Information Sciences 17, Electrical Engineering and Computer Science 4, or Mathematics 10

Statistics

One course selected from Decision and Information Sciences 40 or Economics 55

During their junior and senior years, students must complete the balance of the 175 quarter units required for graduating. Besides the Advanced-Level Religious Studies course, these must include a minimum of 13 upper-division courses (65 quarter units).

1. Eight courses providing a common core of knowledge
   a. Either Management 160 (Organization and Management) or Management 161 (Organizational Structure and Design)
   b. Marketing 181 (Principles of Marketing)
   c. Finance 121 (Financial Management)

d. Economics 114 (Microeconomics I)
e. Decision and Information Sciences 108 (Production Management)
f. International Business: one course selected from Economics 180, Finance 151, Management 170, Marketing 178, or Accounting 133
g. Quantitative Analysis: one course selected from Decision and Information Sciences 100, Mathematics 122, Economics 173, Economics 174, Decision and Information Sciences 104, Accounting 134
h. Management 162 (Strategic Management)

2. Five courses in one of the major fields

Students must also fulfill the course requirement for the departmental major. For these requirements, consult the departmental description for the respective major: Accounting, Decision and Information Sciences, Economics, Finance, Marketing, Organizational Analysis and Management.

Depending on the departmental major requirements, students will have a number of elective courses. At least 40 percent must be in courses offered outside the Leavey School of Business and Administration. It is expected that students will distribute their electives among the behavioral sciences.

The University also offers two programs, the International Business program, open to students in the Leavey School of Business and Administration and the College of Arts and Sciences, and the Retail Studies program, open to all students. Further information on these programs appears in the Special Programs section of this catalog.

LEAVEY SCHOOL OF BUSINESS AND ADMINISTRATION
DEPARTMENT OF ACCOUNTING

Professor Emeritus: Thomas Maier
Professors: Paul L. Locatelli, S.J., Charles F. Louie
Associate Professors: Marlynn K. Bohman, James F. Sepe *(Chair)*, Neal L. Ushman
Assistant Professors: Vidya N. Awasthi, Jane A. Ou, Shahrokh M. Saudagaran

The Accounting program in the Leavey School of Business and Administration provides students with the conceptual and business foundation for careers in public accounting and in business, government, and not-for-profit organizations.

REQUIREMENTS FOR MAJOR

Lower Division

In addition to the University Curriculum and School requirements, accounting majors must include the following courses in their lower-division programs:

1. Management 18 (Legal Environment of Business I) or Management 20 (Legal Environment of Business II)
2. One course in oral communications, either Communication 20 (Public Speaking), Communication 23 (Written and Oral Communication), or Communication 25 (Group Processes)
3. One course in behavioral science chosen from psychology, anthropology, or sociology

Upper Division

The following upper-division courses are required for all accounting majors: 130, 131, 132, 133, 136, 137, 138, and 134 or DISC 104. Students preparing for careers in professional accounting should include 135 (Advanced Accounting Theory).

LOWER-DIVISION COURSES

1. Fundamentals of Accounting I

Introduction to accounting principles and procedures underlying external financial reports. Description of double-entry bookkeeping and the accounting cycle: analyses of accounting for cash, receivables, inventories, plant, and intangible assets. *Prerequisite: sophomore standing.*

2. Fundamentals of Accounting II

Continuation of 1. Accounting for liabilities and ownership interests in partnerships and corporations and the study of the statement of cash flows and financial statement analysis. *Prerequisite: ACTG 1.*

3. Managerial Accounting

Introduction to accounting for management planning and control. Cost-profit-volume relationships, cost and revenue information for nonroutine decisions, and master budgets and profit planning. Discussions of standard costing, responsibility accounting, and decentralization and transfer pricing in the context of management control of operations. *Prerequisite: ACTG 2.*

55. Survey of Accounting Principles

Broad overview of financial accounting principles for business enterprises. (Not open to students in the Leavey School of Business and Administration.)

UPPER-DIVISION COURSES

130. Intermediate Accounting I

Intensive analysis of generally accepted accounting principles as applied to asset accounting. Standards and alternative procedures for accounting for current assets, investments, plant, and intangibles. *Prerequisite: ACTG 2.*

131. Intermediate Accounting II

Intensive analysis of generally accepted accounting principles as applied to accounting for liabilities, stockholders' equity, and the statement of cash flows. Accounting for income taxes, pension, leases, and the reporting of corporate earnings. *Prerequisite: ACTG 130.*

132. Advanced Accounting I

Study of accounting for business combinations and consolidated statements of affiliated corporations. Purchase accounting and pooling of interest accounting, intercorporate asset transfers and other reciprocal relationships, segment reporting for diversified companies, and supplementary reporting for changing

prices, including general price level changes and replacement cost accounting. *Prerequisite: ACTG 131.*

133. Advanced Accounting II

International accounting, including foreign operations and transactions and international accounting standards; accounting for public sector organizations and other not-for-profit organizations, including topics in governmental accounting and accounting for colleges, universities, and health and welfare organizations; partnership accounting from organization and operations to liquidation. *Prerequisite: ACTG 132.*

134. Accounting and Information Systems

Introduction to accounting information systems both in abstract and specific situations—in particular, a study of the influence of computer-based information systems on the functions of the accountant and the accounting profession. Focus on the concepts, applications, and design of accounting information systems that provide management with useful and relevant information. *Prerequisite: ACTG 3.*

135. Advanced Accounting Theory

Financial accounting theory. Historical developments of accounting principles and accounting thought; accounting theories at the structural, interpretational, and behavioral levels; recent developments in empirical research and the role of research in accounting policy decisions of rule-making bodies. *Prerequisite: ACTG 132.*

136. Advanced Cost Accounting

Detailed study of job-order, process, and standard cost accounting systems. Budgeting and standard costs and cost-profit-volume analysis in planning and control. Decentralization, transfer pricing and divisional performance measurement, and the use of accounting data in capital budgeting decisions. *Prerequisite: ACTG 3.*

137. Auditing

Examination of the techniques used to obtain and evaluate evidence regarding (1) assertions about the quality of performance of management (operational auditing); and (2) assertions made by management in financial statements of the firm. *Prerequisite: ACTG 131.*

138. Income Taxation I

Federal income tax practice and theory applied to the determination of tax liability of the individual. Similarities and differences for partnerships and corporations. *Prerequisite: ACTG 131.*

198. Internship

Opportunity for selected upper-division students to work in local government units or firms. *Prerequisite: upper-division standing and approval of the Undergraduate Committee.*

199. Independent Study

LEAVEY SCHOOL OF BUSINESS AND ADMINISTRATION
DEPARTMENT OF DECISION AND INFORMATION SCIENCES

Professors: Chaiho Kim, Steven Nahmias *(Chair)*, Stephen A. Smith, Fred M. Tonge
Associate Professors: Charles D. Feinstein, Manoochehr Ghiassi, Zbynek L. Vancura
Assistant Professors: Srikanth Chari, Rhonda Lee Righter, Paul M. Thompson
Joseph S. Alemany Professor: Chaiho Kim

The Department of Decision and Information Sciences offers instruction to all businesss students in the use of computers and management science techniques to solve the operational and decision-making problems of today's complex organizations.

The Decision and Information Sciences major (DISC) offers courses in the design, implementation, and evaluation of computerized information and decision support systems. Although most of the graduates have chosen careers in management of information systems, some have chosen careers in other functional areas of business such as production and operations management, finance, and marketing.

REQUIREMENTS FOR MAJOR

Lower Division

In addition to the University Curriculum and School requirements, the decision and information sciences major must include the following courses:

DISC 30 (Structured Programming) *or*
DISC 31 (Business Applications Programming)

Upper Division

Five electives from the following:
DISC 102, 103, 105, 106, 107, 109, 110, 111, 112, 113, 115, 117, 198, and 199

LOWER-DIVISION COURSES

17. Introduction to Computers

Basic concepts of computers and computer programming. Basic understanding of computer hardware and software. Extensive hands-on programming experience on microcomputers.

30. Structured Programming

How to develop and implement well-structured programs for business applications using C. Foundation for the study of physical data-base design and operating systems. Students who have received credit for Mathematics 10 may not take

this course for credit. *Prerequisite: DISC 17 or equivalent.*

31. Business Applications Programming

Development of business applications programs using COBOL. Foundation for the study of systems analysis and applications development in the data-base environment. *Prerequisite: DISC 17 or equivalent.*

37. Advanced Computer Programming

Various techniques of advanced programming concepts. *Prerequisite: DISC 30.*

40. Statistics

Theory and applications of probability and statistics for managerial decision-making. Probability theory, random variables, functions of random variables, sampling theory and techniques, statistical estimation and hypothesis testing, and simple and multiple regression analysis. Hands-on experience in problem solving with the SPSS or the SCSS statistical package on VAX-8650 computer. *Prerequisites: Math 11 and 12 and DISC 17 or equivalent.*

70. Physical Data-Base Design

Methodology for design of physical file structures to support single and multiple file applications. Data structures, file structures, file access methods, file manipulation, and algorithmic analysis. *Prerequisite: DISC 30.*

UPPER-DIVISION COURSES

100. Quantitative Methods

Concepts and applications of quantitative models for managerial decision-making. Models include linear programming, transportation, network, waiting line, and simulation. *Prerequisite: DISC 40 or equivalent.*

102. Seminar in Decision Science

Topics related to current faculty interests. Consideration of relevant new developments in theories and applications in the area of decision science. *Prerequisite: permission of instructor.*

103. Operations Research

Fundamental concepts in operations research for controlling stochastic environments. Brief review of probability concepts. Discussion of Markov processes with application to such areas as brand switching, waiting-line processes, and inventory models. *Prerequisites: Math 11 and 12.*

104. Management Information Systems

Introductory course in management information systems. Data processing technology, data management, functions of MIS, MIS design, and implementation and evaluation of MIS systems. *Prerequisite: DISC 17.*

105. Data-Base Management

Study of the ways in which the large and very large data bases in business and other organizations are stored, retrieved, and updated. At the storage level or physical level, the appropriateness of different physical file structures for different applications. At the conceptual level, the principal approaches to modeling data: the relational, hierarchical, and network data models. Specialized languages for data management and the integration of the aforementioned concepts and capabilities in generalized data-base management systems. *Prerequisite: DISC 104 or permission of instructor.*

106. Systems Analysis and Design

Introduction to the concept of systems analysis and design with an emphasis on the computer-based information system. *Prerequisite: DISC 100 or 104.*

107. Operating Systems

Survey of the functions of the integrated sets of programs, called operating systems, that control the operation of computers. Foundations for understanding the basic issues of data management, data communications, and performance evaluation of computer systems. Asynchronous processes, concurrent processes, process and job scheduling, deadlock problems, memory management, device management, file systems, and recovery and security procedures. Students who have received credit for EECS 177 may not take this course for credit. *Prerequisite: DISC 30 or equivalent.*

108. Production Management

Survey of problems and analysis related to the production of goods and services. Topics chosen from the following: demand forecasting, production planning and scheduling, inventory control, material requirement planning, cost and quality control, facility location, and layout. *Prerequistite: DISC 40 or equivalent.*

109. Office Information Systems

Survey of office automation for the business manager. Overview of current equipment, techniques for planning and evaluating office information systems, and human and organizational impacts of office automation. Practical experience in office automation through case study projects and use of the University's computer systems. *Prerequisite: DISC 100 or 104.*

110. Computer Simulation Modeling

Examination of computer simulation modeling for the design and operation of complex processes or systems. Theory and techniques of simulation and simulation languages such as SLAM, GPSS, and GASP. inventory control, assembly and job shop scheduling, and manufacturing process design. *Prerequisites: DISC 30 and 40 or consent of instructor.*

111. Computer Communication Systems

Study of the concepts, hardware, software, economics of data communication, computer networks, and distributed processing systems. Communication technologies, terminal types, single- and multi-host network configurations, network design, distributed processing modes, distributed data bases, cost-benefit analysis in telecommunications, and distributed processing. *Prerequisite: DISC 100 or 104.*

112. Artificial Intelligence for Business

Study of the applications of artificial intelligence techniques for designing and implementing expert systems for business and industrial applications. Experience in building simple knowledge-based systems using LISP or PROLOG programming languages. *Prerequisite: DISC 100 or 104.*

113. Decision Support Systems

Study of the design, implementation, and evaluation of interactive computer-based systems that help decision-makers utilize data and models to solve semistructured and unstructured problems. *Prerequisite: DISC 100 or 104.*

117. Software Development Project

Integration of system and programming concepts to develop a comprehensive software system. *Prerequisite: DISC 30 or 31.*

198. Internship

Opportunity for selected upper-division students to work in local government units or fims. *Prerequisite: upper-division standing and approval of the Undergraduate Committee.*

199. Independent Study

LEAVEY SCHOOL OF BUSINESS AND ADMINISTRATION
DEPARTMENT OF ECONOMICS

Professors: Mario L. Belotti, William F. Donnelly, S.J., Alexander J. Field *(Chair)*, John M. Heineke, Hersh M. Shefrin, Thaddeus J. Whalen, Jr.
Associate Professors: Peter Chinloy, Henry G. Demmert, Thomas R. Russell
Assistant Professors: Richard T. Coz, S.J., Laurence R. Iannaccone, Linda Kamas, William A. Sundstrom
Acting Assistant Professor: Laurence Levin
W. M. Keck Foundation Professor: Mario L. Belotti

A social science primarily concerned with the production and distribution of society's material wealth, economics deals with production, pricing, and investment at the corporate and industry levels and with the problems of unemployment, inflation, income distribution, government spending and taxation, and economic efficiency at the national level. Economists are also concerned with international economic relations and with problems related to the economic development of Third World countries.

Because of its methodology and its subject matter, economics provides an excellent background for the study of law. It is also acknowledged to provide the most useful and comprehensive academic preparation for entry into the MBA program.

The vast majority of graduates in economics enter careers in business; domestic and international banking; local, state, and federal governments; or private economic consulting. Many pursue graduate work in economics, law, business, and public policy.

REQUIREMENTS FOR MAJOR

1. Economics 114, 115, and 116
2. Four economics electives

LOWER-DIVISION COURSES

1. Principles of Economics I

Introduction to the general principles, terminology, and methods of macroeconomics.

2. Principles of Economics II

Introduction to the general principles, terminology, and methods of microeconomics.

3. Principles of Economics III

Contemporary economic issues and problems. Use of the methodology and tools learned in Economics 1 and 2 to investigate in detail some of the major economic issues of the day. *Prerequisites: ECON 1 and 2 or permission of the instructor.*

12. Economic History and Development

History and economic development with special attention to the North Atlantic community. Comparative institutions and economic systems.

55. Statistics

Introduction to statistical methods and techniques for both discrete and continuous random variables. *Prerequisites: Math 11 and 12.*

UPPER-DIVISION COURSES

Prerequisites: Economics 1 and 2, or permission of the Undergraduate Committee, are required for all upper-division courses.

114. Microeconomics I

Introduction to the theory of demand, production, cost, and pricing.

115. Aggregate Economic Theory

Macro, or aggregative, aspects of the economy, emphasizing modern macroeconomic models for explaining the level of output, employment, and prices.

116. History of Economic Thought

Evolution of economic ideas and their influences on the development of economic practices. *Prerequisites: ECON 114 and 115.*

117. European Economic History

Study of the preindustrial environment and industrial growth patterns of Western Europe.

118. Comparative Economic Systems

Performance of market economies is contrasted to those of centrally planned, nonmarket economies and to those of "mixed" economies. The question of performance is addressed from both a theoretical and a practical point of view.

119. American Economic History

Study of growth and institutional change in the U.S. economy since colonial times. Topics include early industrialization, the economics of slavery, and the rise of large business enterprises and labor unions.

120. Economics of the Public Sector

Microeconomic analysis of the role of government in the market economy. Supply of public goods and services, government's role in controlling externalities and regulating private industry, and the economics of the political process. *Prerequisite: ECON 114.*

121. Microeconomics II

Applications of microeconomic theory to familiar economic problems. *Prerequisite: ECON 114.*

122. Money and Banking

Theoretical, institutional, and historical approach to the study of money and banking, with particular emphasis on the relationship between the monetary and banking system and the rest of the economy. (Students may not take *both* Economics 122 and Finance 126 for credit.)

124. Industrial Organization

Microanalysis of the structure, conduct, and performance of U.S. industry. *Prerequisite: ECON 114.*

126. Economics and the Law

Application of the tools of economic theory to the analysis of law and legal institutions as they exist in the contemporary United States. *Prerequisite: ECON 114 or permission of the instructor.*

127. Public Finance: Taxation

Analysis of various types of tax policies and their effect on the economy. Individual income taxes, corporate income taxes, consumption taxes, payroll taxes, state

and local taxes, and other alternative forms of taxation.

128. Business Cycles and Forecasting

Study of the nature and causes of economic instability in an industrial economy.

129. Economic Development

Analysis of the historical and theoretical context underlying present efforts to increase the rate of economic growth in underdeveloped countries.

130. Latin American Economic Development

Examination of the economic development of Latin American countries, with particular emphasis on the relationships between economic growth and their social, political, and economic structures.

131. African Economic Development

Study of the economic development of Africa, with particular emphasis on the relationships between economic growth and African social, political, and economic structures.

132. Asian Economic Development

Study of the economic development of Asian countries, with particular emphasis on the relationships between economic growth and their social, political, and economic structures.

134. Growth Dynamics and Planning

Study of various theoretical growth models and their application to development, planning, and project evaluation. *Prerequisites: ECON 114 and 115.*

135. Economic Development of Japan

Analysis of the historical development of modern Japanese economy from the Meiji era to the present with an emphasis on the relationship between government, business, and labor.

140. Real Estate and Urban Economics

Examination of the economics of urban problems with emphasis on location and land use, the real estate market, and transportation. *Prerequisite: ECON 114 or permission of instructor.*

142. Economics of Natural Resources

Exploration of the supply of, and demand for, energy from national and international perspectives. Investigation of the relationship among energy use, economic growth, and the environment.

143. Real Estate

One quarter in senior year. Entails a research project on a specific program. Includes financing, marketing, development, and construction. (Open only to students admitted to the Real Estate program.)

144. Real Estate Studies Program Internship

One quarter spent as an employee of a real estate firm or lender. Students exposed to construction, appraisal, or financing. (Open only to students admitted to the Real Estate program.)

150. Human Resources Economics

Study of labor productivity, incomes, and employment and how these are affected by labor organizations and labor legislation.

161. The Economics of Poverty

Study of the economic conditions that lead to poverty and possible alternative policies directed at modifying such conditions.

162. Ethics and Economic Thought

Use of welfare economics to investigate the issues of distributive justice and market allocation. Topics include utilitarianism, Rawls's maximin principle, Nash fairness, and Arrow's impossibility theorem.

170. Mathematical Economics and Optimization

Generalization and reformulation of many familiar micro- and macroeconomic models as mathematical systems. Focus on exploring the properties of these models using mathematical techniques on static models. *Prerequisites: Math 11 and 12 and ECON 114 and 115, or consent of instructor.*

171. Mathematical Economics: General Equilibrium Theory

Study of the mathematical model of market equilibrium. Existence, uniqueness, efficiency, core equivalence, dynamics, and growth.

173. Econometrics

Methods to analyze economic data. Time series data, index numbers, hypothesis testing, and simple regression. *Prerequisites: ECON 55 and DISC 17.*

174. Statistical Analysis

Foundations of statistical research methods, including distribution theory, estimation, testing, and prediction, with special emphasis on multivariate models. *Prerequisites: Math 11 and 12 or equivalent.*

177. Advanced Econometrics

Introduction to the techniques used by economists to estimate and test economic relationships. Focus on regression analysis, time series problems, and estimation of multiple equation models. *Prerequisite: ECON 174 or equivalent.*

180. International Economics

Analysis of the theory of international trade, problems in balance-of-payments adjustments, and international economic policies. *Prerequisite: ECON 114.*

182. International Business Economics

The institutions and processes influencing the environment for an enterprise involved in international business. Examination of the concepts, information sources, determinants of exchange rates, and evolution of the multinational corporation. Open only to nonmajors.

185. Economics of Technological Change

The economic consequences and causes of technological change. Examines a succession of technological and organizational breakthroughs and the developments that made these breakthroughs possible.

188. Economics Seminar

Modern economic theories and problems. Admission by invitation only.

198. Internship

Opportunity for selected upper-division students to work in local governmental units or firms. *Prerequisite: upper-division standing and approval of the Undergraduate Committee.*

199. Independent Study

LEAVEY SCHOOL OF BUSINESS AND ADMINISTRATION
DEPARTMENT OF FINANCE

Professors: Francis J. Corrigan, Wayne Y. Lee
Associate Professor: Meir Statman *(Chair)*
Assistant Professors: Sally A. Hamilton, Diana Hancock, Hoje Jo, Michael E. Solt

The finance function, practiced at the personal or organizational level, private and public, is an integral part of the resource allocation process in a well-functioning economy. Through course work that blends theory and practice, the Finance Department seeks to provide students with the background and skills necessary to meet the ever-increasing complexity and demands of today's product and capital markets.

REQUIREMENTS FOR MAJOR

1. Finance 121 and at least two courses from 124, 125, and either 126 or Economics 122
2. Three electives from Finance 124, 125, 126 (or Economics 122), 127, 128, 129, 143, 144, 145, 148, 150, 151, 198, and 199

UPPER-DIVISION COURSES

121. Financial Management

Introduction to the basic concepts of working capital and fixed asset management, valuation, and cost of capital. Topics include financial analysis and forecasting, cash management, credit policy, capital budgeting, short- and long-term financing, stock and bond valuation, dividend policy. *Prerequisites: ACTG 1, 2, and 3.*

124. Investments and Investment Institutions

Introduction to the nature and functions of securities markets and types of financial instruments traded. Topics cover the formulation of investment goals and policies, trading strategies, and portfolio management. Focus is on security analysis and valuation. *Prerequisite: FNCE 121.*

125. Financial Policy

In-depth examination of the interrelationships between investment and financing decisions and their impact upon a firm's pattern of cash flows, return, and risk. Special emphasis on the development of analytical techniques and skills for analyzing performance reflected in financial statements. Case studies may be used. *Prerequisite: FNCE 121.*

126. Dynamics of the Financial System

Role and function of financial institutions, financial flows, interest rate structures, money, and capital markets. Highlights the implications for the formulation of business financial policy. (Students may not take *both* Finance 126 and Economics 122 for credit.) *Prerequisite: FNCE 121.*

127. Personal Finance

Survey of various areas in personal financial planning. Personal credit and its uses; home ownership (tax effects and other advantages); basic investment media; estate planning.

128. Real Estate Finance

Analytical concepts associated with the financing of real estate. Market, location, and risk analysis; modern appraisal methods; and impact of economic and environmental trends on real estate values. *Prerequisite: FNCE 121.*

129. Senior Finance Seminar

Selected topics in financial management, theory, and research. Topics will be partially determined by interests of the instructor and seminar members. Emphasis on discussion of papers and individual readings. *Prerequisites: FNCE 124, 125, or 145, depending on instructor.*

143. Real Estate

One quarter in senior year. Entails a research project on a specific program. Includes financing marketing, development, and construction. (Open only to students admitted to the Real Estate Program.)

144. Real Estate Studies Program Internship

One quarter spent as an employee of a real estate firm or lender. Students are exposed to contruction, appraisal, or financing. (Open only to students admitted to the Real Estate Program.)

145. Management of Financial Institutions

The general management and policies of financial institutions. Topics include regulation of financial institutions, interest rate risk management, liquidity, credit and capital management, investment, and commercial and mortgage banking. *Prerequisites: FNCE 121 and 126 or consent of instructor.*

148. Principles of Insurance

Survey of the general principles of insurance and their application to the various branches of the field. *Prerequisite: FNCE 121.*

150. Life Insurance

Study of the theoretical concepts that underlie the business and personal uses of life insurance and annuities.

151. International Finance

Examination of the functioning of the international monetary system as well as the financial problems of business firms operating internationally. Transfer of international payments, foreign exchange rates, balance of payments, international liquidity, investment, financial markets, banking, and financial management. *Prerequisite: FNCE 121.*

198. Internship

Opportunity for selected upper-division students to work in local governmental units or firms. *Prerequisite: upper-division standing and approval of the Undergraduate Committee.*

199. Independent Study

LEAVEY SCHOOL OF BUSINESS AND ADMINISTRATION
DEPARTMENT OF MARKETING

Professor Emeritus: Ronald L. Stucky
Professors: Albert V. Bruno, Shelby H. McIntyre *(Chair)*, Tyzoon T. Tyebjee
Associate Professors: Dale D. Achabal, Karen F. A. Fox, J. Michael Munson
Assistant Professor: Edward F. McQuarrie
Glenn Klimek Professor: Albert V. Bruno
L. J. Skaggs Professor: Dale D. Achabal

Marketing operates at the cutting edge of a well-managed organization. Development of decision-making and managerial skills are the major objectives of the Department of Marketing program, with special emphasis in the areas of innovation, high technology, retailing, and consumer products.

REQUIREMENTS FOR MAJOR

1. Marketing 181, 183, and 189
2. Three courses from Marketing 165, 166, 178, 179, 182, 184, 185, 187, 198, and 199

UPPER-DIVISION COURSES

165. Retail Management

Study of trends in retailing and the special managerial problems of retailers. Critical analysis of the retailing process, the environment within which it operates, and the managerial functions that are performed. In-depth examination of financial and merchandise strategies.

166. Retail Studies Program Internship

One quarter (usually summer or fall quarter of the senior year) spent as a full-time employee of a major retailer. During the internship, students are exposed to at least two of the following areas: merchandising, personnel, store management, operations, finance, and advertising/promotion. Open only to students admitted to the Retail Studies program. *Prerequisites: MKTG 165 and 181.*

168, 169. Retail Studies Seminars

In-depth examination of a number of topics useful to future executives in a retailing environment. Retail accounting methods, merchandise information systems, personnel and sales force management, negotiation, sales promotion and advertising, communications, merchandising, and retail strategy. *Prerequisites: MKTG 181, 165, 166, and consent of instructor.*

178. International Marketing

Study of the principles, instruments, and institutions of international marketing. International marketing issues relevant to penetrating foreign markets through exports, licensing, joint ventures, and multinational operations. *Prerequisite: MKTG 181.*

179. Small Business Entrepreneurship

Evaluation of venture ideas and the conversion of these ideas into viable ventures. Discussions of cases, lectures, and presentations by guests who have had experience relating to the starting of new

enterprises (e.g., bankers, attorneys, entrepreneurs). Members of the class are asked to develop their own five-year business plan for a new enterprise. *Prerequisite: some knowledge of accounting and finance.*

181. Principles of Marketing

Exploration of the role of marketing in society. Discussion of marketing institutions and analysis of the critical position of marketing in business strategy. Analysis, planning, and control of the marketing function. Use of cases and field projects to apply basic principles.

182. Marketing Management and Strategy

Concepts of marketing strategy and planning applied to consumer, industrial, and services businesses, as well as to nonprofit organizations. *Prerequisite: MKTG 181.*

183. Buyer Behavior

How consumers process information and make buying decisions. Investigation of influence factors (such as personality, culture, social class, motivation, perception, family, reference groups) on consumer decision-making. Decision processes of industrial buyers are also studied and compared to those of nonindustrial buyers. Particular emphasis on understanding the decision-making process (both consumer and industrial) and its application to the development of sound marketing strategy. *Prerequisite: MKTG 181 or consent of instructor.*

184. Advertising and Promotion

Study of the role of advertising in marketing. The communication process, definition of advertising objectives, strategy formulation, budgeting, media selection, copy testing, evaluating advertising results, and regulation. Student groups are required to develop and competitively present a comprehensive marketing plan or similar project. *Prerequisite: MKTG 181.*

185. Sales Management

Incorporation of current sales management and quantitative techniques with concepts from the behavioral sciences. The various duties of the sales manager with particular emphasis on the integrative nature of the tasks. *Prerequisite: MKTG 181.*

187. Brand/Product Management

Dynamic decision-making using a brand management game. Brand teams make inferences about the business environment, decide on what products to offer, what price to charge, how many salespeople to employ, and how much to budget for advertising, in addition to making production and marketing research decisions. Emphasis on the writing and presentation of the brand plan. *Prerequisite: MKTG 181.*

189. Marketing Research

Study of the application of marketing research methodology to the solution of business problems. Role of marketing research: its design, execution, analysis, and implementation. Field projects and use of computers to analyze data. *Prerequisite: MKTG 181.*

198. Internship

Opportunity for upper-division students to work in local firms and complete a supervised academic project in that setting. *Prerequisites: declared Marketing major, either MKTG 183 or 189, and approval of faculty coordinator.*

199. Independent Study

LEAVEY SCHOOL OF BUSINESS AND ADMINISTRATION
DEPARTMENT OF ORGANIZATIONAL ANALYSIS AND MANAGEMENT

Professors: André L. Delbecq, Barry Z. Posner
Associate Professors: David F. Caldwell *(Chair)*, Jacques Delacroix, James L. Hall, Joel K. Leidecker, Peter K. Mills, Dennis J. Moberg
Assistant Professor: Mark A. Seabright
Senior Lecturer: David R. Palmer

The Department of Organizational Analysis and Management emphasizes rigorous theory and managerial application. Courses are offered in areas such as organizational behavior and design, personnel administration, industrial relations, and managerial communication. Additional courses in strategic management, business and public policy, and international management provide a middle-level management perspective.

Majors in management are those who want to develop balanced general management skills or to specialize in human resource management. Students with other majors who aspire to supervisory or managerial positions will find several of the department electives useful.

REQUIREMENTS FOR MAJOR

1. Three required courses: Management 60 *or* 160, 161, and 173
2. Three courses from Management 164, 165, 166, 167, 169, 170, 171, 172, 197, 198, and 199

LOWER-DIVISION COURSES

11. Business and Society

Discussion and clarification of the role of business in modern society and its relationship with the social, political, and economic environments. The external environment of business and forces influencing the scope, functions, and objectives of business institutions. Lectures, class discussions, and case analyses.

18. Legal Environment of Business I

Examination of the law of contracts, agency, sales, commercial paper, secured transactions in personal property, personal property especially as applied to business, and a general investigation of law and court systems.

20. Legal Environment of Business II

Recognition and appreciation of legal problems incident to business transactions and how to achieve an ethical solution. Real property, partnerships, corporations, insurance, suretyship, and bankruptcy.

60. People in Organizations

Human behavior and job performance, motivation theory, interpersonal and group relationships, leadership, conflict and change. Cases, role plays, simulations, and exercises used to demonstrate principles. Open only to sophomores. (Business School students who take MGMT 60 must also take MGMT 161, rather than MGMT 160.)

UPPER-DIVISION COURSES

160. Organization and Management

Introduction to organization theory and practice, including management operation, concepts of organization, departmental and interdepartmental relations, and behavior in organizations. (Not open to students who have taken MGMT 60.)

161. Organizational Structure and Design

Theory and practice of organizational design. Issues include departmentation and coordination, the effect of context and technology on structure, and organizational growth, change, and decline. *Prerequisite: MGMT 60 or 160.*

162. Strategic Management

Study of the interrelationship and coordination of required functional courses, including accounting, finance, management, marketing, and production–leading to the formulation and implementation of corporate strategy. Comprehensive case analyses. *Prerequisite: senior standing.*

164. Service Sector Management

Course designed to increase the awareness of the post-industrial or service business sector and to provide the business student with the perspective and analytical tools to examine the unique features of service organizations and their relationship to other sectors of the economy. Attempts to develop a broad knowledge of types of service organizations and their respective dimensions, and to develop a sensitivity to the productivity problems and pressures confronting managers of service-sector organizations. *Prerequisite: MGMT 60 or 160.*

165. Organizational Politics

The use and misuse of power to influence organizational and personal outcomes. Emphasis on developing ethical and effective solutions to complex organizational problems where authority is inadequate. Principles are highlighted with the use of films, simulations, and cases. *Prerequisite: MGMT 60 or 160.*

166. Personnel Administration

Comprehensive review of the role and functions of personnel departments in business organizations, with particular emphasis on selection and placement, training and development, and compensation systems. *Prerequisite: MGMT 60 or 160.*

167. Industrial Relations

Examination of union-management relations. Why do employees join unions? How are organizing campaigns and elections won? What are typical negotiating behaviors and strategies? Lecture/discussion, case analyses, negotiation and arbitration simultations, guest speakers. *Prerequisite: MGMT 60 or 160.*

169. Business and Public Policy

Study of the impact of social issues on business and business responses to adapt to and influence public policies. Includes ideology, corporate social responsibility, government regulations, and business political activity. Lectures/discussions; case analyses. *Prerequisite: MGMT 60 or 160, or permission of instructor.*

170. International Management

Overview of the issues and problems confronting managers in international

work, divided into three segments: the global framework for shared production and trade, institutions by which international work is negotiated and regulated, and operational structures and strategies used by firms and controlled by managers and government representatives. Includes cases and provides a special understanding of nation-state benefits and controls, cultural-developmental variables, and human resource supplies and skills. *Prerequisite: MGMT 60 or 160.*

171. Managerial Communication

Interpersonal and small group communication. Negotiating behavior. Oral and written communication. Integrates theory and skill-building through reading, case analysis, and practice. *Prerequisite: MGMT 60 or 160, or permission of instructor.*

172. Special Topics in Management

Course will be offered occasionally to introduce new topics that are not covered by existing electives. Topics will generally reflect the research interests of the faculty teaching the course. *Prerequisite: MGMT 60 or 160.*

173. Applied Organizational Analysis

Course primarily involves conducting an analysis of an organizational topic. Each student will work closely with a departmental faculty member in selecting and developing a topic that will result in a project paper and presentation to the department. Course provides students with background information useful in the job search. Class sessions include research methods and presentations. *Prerequisite: MGMT 161.*

197. Moral Responsibility and Business Practice

Examination of issues of social justice and responsibility in terms of contemporary business policy and practice. By applying ethical theory to case situations, the student should develop skills of moral reasoning in the complex personal, social, political, economic, and technological problems faced by modern managers. Taught by Charles J. Dirksen Professor of Business Ethics.

198. Internship

Opportunity for selected upper-division students to work in local organizations. *Prerequisite: upper-division standing and approval of the Undergraduate Committee.*

199. Independent Study

INSTITUTE OF AGRIBUSINESS

Professors: Mario L. Belotti *(Director)*, Robert A. Collins
Assistant Professors: Gregory A. Baker, S. Andrew Starbird
Naumes Family Professor: Robert A. Collins

The Institute of Agribusiness in the Leavey School of Business and Administrations offers an MBA in Agribusiness and the following undergraduate classes:

101. Food Production and Technological Change

The impact of modern technological developments from the green revolution to the biotechnology revolution on food supplies and on the organization of food production systems at the national and international levels. *Prerequisites: ECON 1 and 2.*

183. Commodities and Futures Markets

Introduction to the structure, operation, and functions of agricultural commodity markets. Topics include the determinants

of agricultural price movement, speculation strategies, hedging strategies, options on agricultural futures, and the fundamental and technical analysis of prices. *Prerequisites: ECON 1 and 2.*

186. Principles of Agricultural Economics

Study of the U.S. agricultural sector with emphasis on California: problems of production, comparative advantage of Western farm products on domestic and international markets, U.S. contributions to the world food supply. *Prerequisites: ECON 1 and 2.*

7

School of Engineering

The School of Engineering provides knowledge of the mathematical and natural sciences, to prepare students to develop and use technology for the benefit of mankind.

The School of Engineering confers a Bachelor of Science degree in Civil Engineering, Computer Engineering, Electrical Engineering, Engineering, and Mechanical Engineering. A minor in engineering is also available. The program of study for the degree of Bachelor of Science includes courses that fulfill the goals of the University Curriculum, School of Engineering curriculum, and engineering departmental major curriculum. Junior standing in the Engineering School requires qualification by meeting certain minimum academic standards.

REQUIREMENTS FOR MAJOR: BACHELOR OF SCIENCE

The program leading to a degree of Bachelor of Science consists of a minimum of 196 quarter units with a grade point average of at least a C (2.0) in all course work at the University and in the student's engineering courses. Students must declare a major as a condition of registering for the junior year.

For the Bachelor of Science degree, students must fulfill the following University requirements:

Composition and Literature

Two courses, normally English 1 and 2

Western Culture

Two courses in one of the following sequences: (a) English 11, 12, and 13; or (b) History 11, 12, and 13; or (c) Philosophy 11, 12, and 13; or (d) Art History 11, 12, and 13. The two courses in Western Culture should normally be taken in sequence.

Foreign Language

Recommended proficiency in one foreign language, which may be achieved in high school

Social Sciences

Two courses from the approved offerings in the departments of Anthropology and Sociology, Economics, Political Science, or Psychology

Mathematics and Natural Sciences

Particular course requirements are in the respective departmental major descriptions.

Ethics

One course in general or applied ethics from approved ethics offerings in the Department of Philosophy

Religious Studies

Three courses in Religious Studies: (a) two courses, normally taken during the freshman and sophomore years—one Introductory-Level Religious Studies course and one Intermediate-Level Religious Studies course and (b) one Advanced-Level Religious Studies course, taken after completing 88 quarter units. These courses are to be taken in sequence.

Prerequisites

Prerequisites for engineering courses will be enforced. If there are any questions as to your qualifications for a course, check with the instructor.

Students must fulfill the following requirements for a *Bachelor of Science Degree in Civil Engineering.*

Humanities	**Units**
University requirements	41
English 182	2
Mathematics and Science	
Math 11, 12, 13, 21, 22 (or AMTH 106), AMTH 108	24
Chemistry 5, 6	10
Physics 4, 5, 6	13
CENG 20	4
Engineering	
EECS 4, 50	9
MECH 10, 121, 122	12
CENG 10, 41, 42, 43, 115, 121, 125, 128, 132, 134, 135, 140, 141, 143, 145, 192, 193	66
One design elective from CENG 133, 136, 137, 138, 142, 144, 147	4
One technical elective from CENG 118, 139, 198, 199, and design electives listed above	3
Electives	8

Total	196

Students must fulfill the following requirements for a *Bachelor of Science Degree in Computer Engineering.*

Humanities	**Units**
University requirements	41
English 182	2
Mathematics and Science	
Math 11, 12, 13, 21, 22 (or AMTH 106), 122 (or AMTH 108)	24
Chemistry 5, 6	10
Physics 4, 5, 6	13
One of the following: Math 53 (Linear Algebra), Math 166 (Numerical Analysis), AMTH 118 (Numerical Methods)	4
Engineering	
CENG 41	4
MECH 10, 121	7
EECS 4, 5, 22, 50, 70, 72, 79, 100, 115, 121, 124, 172 or 174 or 176, 179, 194, 195, 196	64
Five additional upper-division computer engineering courses forming a coherent emphasis area selected in consultation with academic adviser	20
Recommended emphasis areas include	
a. 172, 174, 176 (software engineering)	
b. 122, 127, 133 (digital systems)	
c. 122, 177, 178 (computer subsystems)	
d. 171, 172, 175 (programming languages)	
Electives	8
Total	197

Students must fulfill the following requirements for a *Bachelor of Science Degree in Electrical Engineering.*

Humanities	**Units**
University requirements	41
English 182	2
Mathematics and Science	
Math 11, 12, 13, 21, 22 (or AMTH 106), and one math elective	24
Chemistry 5, 6	10
Physics 4, 5, 6, 7	18
Engineering	
CENG 41, 42	8
MECH 10, 121	7
EECS 4, 22, 50, 100, 104 and 105, 110, 115, 116, 121, 151, 194, 195, 196	57
A minimum of 13 units taken from one of the following Electrical Engineering emphasis areas:	13
a. 111 (or 114 or 117), 112, 130 (circuits and systems)	
b. 141, 144, 133 (communications)	
c. 109, 144, 145 (microwaves)	

d. 160, 161, 162 (power and machines)
e. 152, 153, 154 (microelectronics)
f. 122, 124, 127 (or 107) (digital systems and information storage)

Technical electives (chosen from upper-division EECS courses)	9
Electives	8
Total	197

Students must fulfill the following requirements for a *Bachelor of Science Degree in Mechanical Engineering.*

Humanities	**Units**
University requirements	41
English 182	2
Mathematics and Science	
Math 11, 12, 13, 21, AMTH 106, AMTH 108 or 118	24
Chemistry 5, 6	10
Physics 4, 5, 6	13
MECH 15	5
Engineering	
CENG 41, 42, 43	13
EECS 4, 50	9
MECH 10, 11, 114, 115, 116, 121, 122, 123, 131, 140 141, 160, 194, 195, 196,	63
Options	8

a. Dynamics and Controls Option
MECH 142, 143
b. Thermo-Fluids Option
MECH 132, 133

Electives	8
Total	196

Students must fulfill the following school and major requirements for a *Bachelor of Science Degree in Engineering* (3.25 GPA required for junior entry).

Humanities	**Units**
University requirements	41
English 182	2
Mathematics and Science	
Math 11, 12, 13, 21, 22 (or AMTH 106), and one math elective	24
Chemistry 5, 6	10
Physics 4, 5, 6	13
MECH 15	5
Engineering	
CENG 41, 42, 43	13
EECS 4, 5, 22, 50, 100, 121, 160	32
MECH 11, 121, 122, 123	18
One of the following sequences:	8

a. EECS 194 and 195
b. CENG 192 and 193
c. MECH 114 and 115

Electives	30
Total	196

ENGINEERING HONOR CODE

The Engineering Honor Code is a long-standing Santa Clara tradition. Instituted at the request of the engineering students, the code states: *"All students taking courses in the School of Engineering agree, individually and collectively, that they will not give or receive unpermitted aid in examinations or other course work that is to be used by the instructor as the basis of grading."* Students and teachers cooperate and share responsibilities under the code. *Teachers* are responsible for making clear what aid is permissible and for using procedures that minimize temptations to violate the code. *Students* are responsible for behaving honorably, for actively ensuring that others as well as themselves uphold the code, and for being responsive to violations. *Students* dominate the administration of the code, and they take full responsibility for trying cases of alleged violations and for recommending penalties. Alleged violations should be reported to the Engineering Honor Code Committee. More information on the code and its procedures is contained in a leaflet available from the School of Engineering and the department offices.

FACILITIES FOR ENGINEERING

The School of Engineering's laboratories are contained in three buildings in the Sullivan Engineering Center originally built in 1960. Major reconstruction and renovation of existing facilities was completed in 1987. These facilities are supported by the incremental tuition for engineering students.

General Computing Facilities

The School of Engineering has 50 Hewlett-Packard 9000/320 workstations grouped into two classrooms of 20 systems each, with the remaining 10 workstations distributed among engineering laboratories. These systems are based on the Motorola MC68020 processor with 68881 floating-point processor and 1024 x 780 color displays. All workstations run Hewlett-Packard's version of the UNIX operating system and have a variety of software for computer-aided design (CAD) in civil, computer, electrical, and mechanical engineering, as well as a variety of programming languages.

In addition, Santa Clara provides mainframe and personal computing facilities to support educational programs. Free noncredit short courses for both types of computers are offered periodically. Computer labs are typically open from 9:00 a.m. to midnight Monday through Friday, with hours slightly reduced on weekends.

The principal academic mainframe system is a Digital Equipment Corporation VAX-8650 running under the VMS operating system. Approximately 75 terminals are located in three laboratories across campus, and ten dial-up ports are available. Software includes nine programming languages (Ada, LISP, Prolog, Pascal, C, FORTRAN, COBOL, BASIC, and assembler), SPSS and SAS statistical packages, two simulation packages (SLAM and SIMSCRIPT), and two relational data-base systems (RDB and ORACLE). There is also a VAX-11/750 running under the UNIX operating system.

PCs are concentrated in three general-purpose laboratories containing 140 IBM machines and various software packages for word processing, spreadsheet and data-base applications, and programming. Each of these PCs can also function as a terminal to the VAXes.

Most of the academic computers are connected by an Ethernet local area network (LAN) that provides high-speed communications between the various systems. The VAX-8650 is also a node on the BITNET wide-area network, providing students and faculty with electronic mail and file-transfer connections to over 200 institutions in the United States, as well as to others in Canada, Europe, and Japan.

Civil Engineering and Engineering Mechanics Laboratories

The *Civil Engineering Laboratories* contain equipment and facilities for experimentation in materials testing, stress analysis, soil mechanics, geology, concrete testing, surveying, and water quality.

The *Materials Testing Laboratory* is equipped with two universal testing machines for tension and compression testing of construction materials such as steel, aluminum, and wood. A 400,000-pound capacity compression machine is used to test concrete samples. Materials may also be tested in torsion, flexure, impact, and fatique for hardness.

In the *Stress Analysis Laboratory* a variety of strain gauge equipment is used to test structural materials. The laboratory also contains a loading frame and a polariscope. Smaller structural samples can be tested in tension and compression on Instron and Applied Test Systems equipment. An HP Dynamic Signal Analyzer is used for testing dynamic properties of structural systems.

The *Soil Mechanics Laboratory* contains equipment for testing soils in shear, consolidation, compaction, and other physical and chemical tests. Field testing and sampling equipment is also available.

The *Geology Laboratory* is equipped with extensive rock and mineral samples as well as topographic, geologic, and soil maps.

The *Concrete Testing Laboratory* contains facilities for the mixing, casting, curing, and testing of concrete samples.

In the *Surveying Laboratory* a wide variety of equipment, such as self-leveling levels, transits, theodolites, and electronic distance measuring devices, is available for instructional purposes.

The *Water Quality Laboratory* is equipped with instrumentation needed for basic chemical and biological characterization of water and wastewater samples. Several pilot-scale treatment systems are also available.

The department also maintains a design library of reference works and handbooks. Standard plans and other aids for civil engineering design are provided.

Electrical Engineering and Computer Science Laboratories

Laboratories and facilities are used for instruction and research in digital circuits, computers, software, electrical circuits, microelectronics, electronic circuits, microwave and communication, computer graphics, and robotics and servomechanisms.

The *Microelectronics Laboratory* provides teaching and research facilities for semiconductor devices and integrated circuit-design fabrication and characterization. Ongoing research topics include silicon heterostructures, thin dielectrics, and high-temperature superconductors.

The *Microwave and Communications Laboratory* provides a full range of modern measurement capability from 0–22 GHz. It also has extensive computer-aided design and simulation capability, based largely on modern commercial packages. Interconnection of hardware measurements and computer simulation is stressed.

The *Imaging and Information Systems Laboratory* used for graduate research has a SUN 3/280, 3/160, and several color and black-and-white workstations in addition to image digitizing equipment.

The *Robotics, Servomechanism, and Biomechanics Laboratory* includes analog computation capability, servosystems, Hamerslag robotic arm system, and biomechanic measurement and modeling systems.

The *Digital Laboratory* provides complete facilities for experiments and projects ranging in complexity from a few digital integrated circuits and other electronic components to complete computer systems. It includes a variety of development systems to support microprocessor-based design as well as other computer design projects. It also holds facilities to support digital signal processing projects.

Mechanical Engineering Laboratories

The *Mechanical Engineering Laboratories* contain facilities for instruction and research in the fields of fluid mechanics, thermodynamics, heat and mass transfer, propulsion, combustion, power generation, air conditioning, shock and vibration, instrumentation, and control systems.

A variety of internal combustion engines installed on dynamometer stands can be used for studies in diesel and spark-ignition engines. The facilities include instrumentation for evaluating engine performance and for measuring exhaust pollutants. Engine studies can be conducted using a variety of fuels.

The fluid dynamics facilities contain equipment to illustrate the principles of fluid flow and to familiarize the student with hydraulic machines and their associated instrumentation. Each device may be supplied from a pump or from a constant-level standpipe with a 25-foot head. A subsonic wind tunnel equipped with an axial flow fan with adjustable blades is available to conduct experiments in aerodynamics and turbomachinery.

Included also in the Mechanical Engineering Laboratories is equipment to study electromechanical energy conversion, response and control of mechanical systems, direct and alternating current machines, solar energy concentrators, and air conditioning. The metallurgy laboratory features a modern scanning electron microscope that is used to familiarize students with properties of materials. The machine shop is equipped with microprocessor and numerically controlled equipment for student instruction, construction of experimental devices, and student projects.

COOPERATIVE EDUCATION PROGRAM

Joseph T. Ma, Ph.D. *(Coordinator)*

The Cooperative Education program integrates classroom work with practical industrial experience. The program provides the student alternate or parallel periods of college education with periods of training in industry. The industry training is related to the field of study in which the student is engaged and often is diversified to afford a wide range of experience. The objective of the program is to provide students the opportunity, through this interaction of study and work experience, to enhance their academic knowledge, to further their personal and work experience, and to learn about working with people.

The program is open to both undergraduate and graduate students. To qualify for the program, students must have completed at least one quarter at the University. Undergraduates must have junior standing and maintain a 2.5 GPA or above. Graduate students must maintain a 3.0 GPA. Interested students should contact the Cooperative Education Office in the School of Engineering early in their academic program.

Participating students pay tuition for 2 registered units plus an administrative fee of $250.

DA VINCI PROGRAM

Robert J. Parden, Ph.D. *(Coordinator)*

This program is designed to give each student a thorough grounding in the fundamentals of engineering, physical science, mathematics, applied science, humanities, and social science. The program has two objectives: to provide the student with the background needed to select a specific engineering discipline and to prepare the student to pursue that discipline. Exceptional students (3.25 GPA or higher) may choose to work out an individual program for upper-division study with an appropriate adviser. A specific discipline or individual program must be selected by the end of the sophomore year before registration for the junior year.

SCHOOL OF ENGINEERING
APPLIED MATHEMATICS

Professor: Gerald E. Markle *(Chair)*
Assistant Professor: Francis J. Conlan
Adjunct Associate Professor: George R. Fegan

With the exceptions of the three courses below, the Applied Mathematics program is designed for graduate study. A complete listing of the offerings may be found in the *School of Engineering Graduate Programs* bulletin.

UPPER-DIVISION COURSES

106. Differential Equations

First-order linear differential equations, systems of linear differential equations, homogeneous systems of linear differential equations with constant coefficients, the Laplace transform, the solution of differential equations by Laplace transform. *Prerequisite: Math 21.* (4 units)

108. Probability and Statistics

Definitions of probability, sets, sample spaces, conditional and total probability, random variables, distributions, functions of random variables, sampling, estimation of parameters, testing hypotheses. *Prerequisite: Math 21.* (4 units)

118. Numerical Methods

Numerical solution of algebraic and transcendental equations, finite differences, numerical differentiation and integration, and solution of ordinary differential equations. Solution of representative problems on the digital computer. *Prerequisite: ability to program in some computer language.* (4 units)

SCHOOL OF ENGINEERING
CIVIL ENGINEERING AND ENGINEERING MECHANICS

Associate Professors: Joseph J. Fedock *(Chair),* E. John Finnemore, Sukhmander Singh
Assistant Professor: Steven C. Chiesa

Civil engineering encompasses the fields of Water Resources Engineering, Transportation Engineering, Structural Engineering, Environmental Engineering, Geotechnical Engineering, Construction Engineering, and Engineering Mechanics.

Water Resources Engineering deals with the utilization and conservation of surface and ground waters, water supply and distribution, sewage collection and disposal treatment methods, and flood control and irrigation.

Transportation Engineering is related to the planning, design, and operation of highways, airports, railways, waterways, and specialized facilities such as tunnels, canals, and harbors.

Structural Engineering involves planning and design of such structures as bridges, industrial and commercial buildings, and various special purpose structures.

Environmental Engineering deals with theoretical and applied aspects of water supply, pollution control, and solid and hazardous waste management.

Geotechnical Engineering concerns the nature and use of earth media as engineering materials in the analysis, design, construction, and maintenance of foundations, retaining walls, subsurface facilities, and other engineering works.

Construction Engineering pertains to the planning, scheduling, construction, and financing of civil engineering related projects.

Engineering Mechanics relates to solid body mechanics; namely, statics and dynamics of rigid bodies and mechanics of deformable bodies.

Civil engineering students, by careful choice and scheduling of electives in consultation with an adviser, are able to develop a specialized program in a desired field of civil engineering, in addition to the courses required of all civil engineering graduates. Additionally, the civil engineering senior may spend time in a public or private engineering office as an intern, learning the functions of that example of civil engineering practice.

LOWER-DIVISION COURSES

10. Surveying

Survey instruments: their use and care. Principles of topographic mapping, linear measurements, leveling, traverses, curves, boundary, and public surveys. Field laboratory. (4 units)

20. Geology

Development and formation of geologic materials. Significance of structure, land form, erosion, deposition. Stream and shoreline processes. Surface water. Laboratory. *Prerequisite: sophomore standing.* (4 units)

41. Mechanics I (Statics)

Resolution and composition of force systems and equilibrium of force systems acting on structures and mechanisms. Distributed forces. Friction. *Prerequisites: Physics 4 and MECH 10.* (4 units)

42. Mechanics II (Dynamics)

Dynamics of a particle and dynamics of rigid bodies. Work and energy methods. Momentum methods. Kinetics of systems of particles. Introduction to theory of vibrations. *Prerequisite: CENG 41.* (4 units)

43. Mechanics III (Strength of Materials)

Analysis of stresses and strains in machines and structural members. Axial forces, torsion, bending, and combined loads. Stability of columns. Energy theorems and their applications. Laboratory. *Prerequisite: CENG 41.* (5 units)

50. Civil Engineering Procedures

Applications of engineering drafting techniques and procedures to civil engineering design, plans, graphs, and illustrations. Design laboratory. *Prerequisite: CENG 10.* (4 units)

UPPER-DIVISION COURSES

115. Civil Engineering Materials

Origin, manufacture, and processing of materials used in civil engineering. Physical properties of metals, wood, plastics, cement, concrete, and other engineering materials. Corrosion and its prevention. Fire resistance, heat transmission. Laboratory. (4 units)

118. Construction Engineering

Construction management. Equipment. Drawings and specifications, cost estimating, bidding. Contracts, bonds, financing, insurance. Labor. Project planning and scheduling. *Prerequisite: junior standing.* (3 units)

121. Soils Engineering

Origin, development, and properties of soils. Classification of soils and applications of engineering mechanics to soils as an engineering material. Water in soils. Soil testing methods. Compaction, stabilization, consolidation, shear strength, and slope stability. Laboratory. *Prerequisites: CENG 20 and 43.* (4 units)

125. Municipal Engineering Design

Various aspects of civil engineering as applied in municipal (public works) design practice. Maps and plats; site layout and earthworks; drainage; streets and utilities. Design laboratory. *Prerequisites: CENG 10 and MECH 122.* (4 units)

128. Engineering Economics

Time value of money. Economic analysis of engineering projects. Planning and capital budgeting. Rate-of-return analysis. Depreciation. Cash flow analysis. (2 units)

132. Structural Analysis

Analysis of statically determinate beams, trusses, and frames. Influence lines for beams and trusses. Deflections computed using moment area, virtual work, and other analytical methods. Introduction to statically indeterminate analysis using both displacement and force methods. Introduction of matrix methods. *Prerequisite: CENG 43.* (4 units)

133. Timber and Prestressed Concrete Design

Design of timber structures and prestressed concrete structures. Particular attention to the design of main structural members. Timber design project is required. *Prerequisite: CENG 135.* May be taken for graduate credit up to 8 units. (4 units)

134. Structural Steel Design

Concepts of structural steel design for buildings and other structures. Types of loading. Design of individual members including tension members, beams, columns, and connections. Design of a typical structural steel system. Introduction to plastic design. *Prerequisite: CENG 132.* (4 units)

135. Reinforced Concrete Design

Analysis and design of reinforced concrete structural elements using the ultimate strength and working stress methods. Design of elementary structures, e.g., one-story buildings, retaining walls. Design laboratory. *Prerequisite: CENG 132.* (5 units)

136. Advanced Concrete Design

Analysis and design of structural systems such as bridges, buildings, etc., involving reinforced concrete and prestressed concrete. Advanced topics in reinforced concrete design. *Prerequisite: CENG 135.* (4 units)

137. Earthquake Engineering Design

Introduction to the dynamics of single- and multi-degree-of-freedom lumped mass systems. Idealization of real structures and analysis of idealized models by time-history and response spectrum methods. Special considerations for earthquake-resistant design of steel, timber, and reinforced concrete structures. *Prerequisite: CENG 132.* May be taken for graduate credit up to 8 units. (4 units)

138. Foundations Engineering Design

Surveying, mapping, and foundation exploration; bearing capacity and settlement analysis; spread foundations; piles and caissons; earth-retaining structures; loads on underground conduits; subsurface construction. *Prerequisites: CENG 121 and 135.* May be taken for graduate credit up to 8 units. (4 units)

139. Hydrology

Precipitation, evaporation, transpiration, runoff, and infiltration. Drainage areas, concentration points, storage, and floods. Stream-flow hydrographs and routing. Street, highway, and airport drainage. Laboratory. *Prerequisite: MECH 122.* (3 units)

140. Water Resources Engineering

Concepts of various aspects of water resources: surface water, groundwater, water supply and distribution, dams and irrigation. Interrelationship of all aspects. Importance of water resources to the total needs of the community. Laboratory. *Prerequisite: MECH 122.* (4 units)

141. Hydraulic Engineering

Principles of hydraulics; flow in pipes and pipe networks; water hammer and surge tanks; steady flow in open channels, including bends and transitions. *Prerequisites: MECH 122 and CENG 128.* (4 units)

142. Water Resources Design

Design of system components for water supply and flood control projects including storage facilities, closed conduits, open channels, well fields, and pumping systems. Computer applications in the design and evaluation of water resources–related facilities. *Prerequisites: CENG 140 and 141.* (4 units)

143. Environmental Engineering

Water and air quality. Water supply and pollution control; air pollution control. Management of solid and hazardous wastes. Environmental impact assessment. Laboratory. *Prerequisites: Chemistry 6 or equivalent and junior standing.* (4 units)

144. Environmental Systems Design

Design of treatment and distribution systems for potable water. Design of collection and treatment systems for water pollution control and wastewater reclamation. *Prerequisites: CENG 141 and 143.* (4 units)

145. Transportation Engineering Design

Transportation systems analysis and design. Traffic flow. Geometric design of systems. Principles of highway design. Planning, construction, and operation of transportation systems. Transportation policies and economics. *Prerequisites: CENG 10 and senior standing.* (4 units)

147. Pavement Design

Paving materials. Geometric and structural design of highways. Urban street layout and details. Layout and design of airport runways. *Prerequisites: CENG 121 and 135.* (4 units)

188. Co-op Education I

Integration of classroom study and practical experience in a planned program designed to give students practical work experience relating to their academic field of study and career objectives. Alternate or parallel periods of classroom study with periods of training in industry and government. Work includes overall report on assignment activities. P/NP grading. May be taken twice. May be taken for graduate credit. Additional fees required. (2 units)

189. Co-op Education II

Credit given for a technical report on a specific activity such as a design or a research project, etc., after completing the co-op assignment. Approval of department co-op adviser required. Letter grades based on content and presentation quality of report. May be taken twice. May be taken for graduate credit. (2 units)

192. Civil Engineering Design Methods

Introduction to problem-solving methodology for design of civil engineering systems and components. Applications of engineering techniques and procedures to civil engineering design. Relationship to plans and graphs. *Prerequisites: English 182 and CENG 125 and 128.* (2 units)

193. Senior Design Project

Students investigate an approved civil engineering project. The design process—including problem formulation, analysis, preliminary design, final design, and plans—is completed. Students present results at Senior Conference. *Prerequisite: CENG 192.* (4 units)

198. Internship

Time off campus with an engineering organization. Different aspects of work in the assigned professional office. Oral and written reports. *Prerequisites: senior standing and approval of internship coordinator.* (4 or 8 units)

199. Directed Research

Investigation of an approved engineering problem and preparation of a suitable thesis report. Conferences with faculty adviser are required. *Prerequisite: senior standing.* (2–6 units)

SCHOOL OF ENGINEERING
ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

Professor Emeritus: Henry P. Nettesheim
Professors: Geoffrey Bate *(Acting Chair)*, Shu-Park Chan, Timothy J. Healy, John M. Owens, Dragoslav D. Siljak, Cary Y. Yang, Raymond B. Yarbrough
Associate Professors: Hasan S. AlKhatib, Ronald L. Danielson, Ruth E. Davis, Mohammad Ali Ketabchi, Donald P. Leach, Daniel W. Lewis *(Associate Chair)*, Jack A. Peterson, Sally L. Wood, Michael R. Zomlefer
Assistant Professors: Surapol Dasananda, David J. Halchin, M. Mahmudur Rahman, H. Chris Tseng *(David Packard Fellow)*
Engineer and Lecturer, and Director, Institute for Information Storage Technology: Albert S. Hoagland
Wilmot J. Nicholson Family Professor: Shu-Park Chan
Benjamin and Mae Swig Professor: Dragoslav D. Siljak

Electrical engineering includes the design, construction, and operation of electrical components, circuits, and systems. Electrical engineers are concerned with all phases of the electrical transmission of information such as in radio, television, satellite communications, fiber optics, electric power, and telephone systems. Data-processing and data-storage equipment and computers used by business, industry, and government are included in their major area of interest.

The Computer Engineering degree features a balanced core program in which each student studies the engineering aspects of hardware and software as well as the underlying theory of computation. The Computer Engineering electives permit students to build on this core with varying emphasis, depending on their interests, in the three areas of hardware, software, and the theory of computation.

The Computer Engineering program is supported by the facilities of the University's Academic Computer Center, as well as six major teaching and research laboratories and three additional laboratories used only for teaching. The principal computers for the University's academic functions include a

Digital Equipment Corporation VAX-8650, and six microcomputer laboratories with over 225 IBM PCs. In addition, the School of Engineering has a large number of workstation systems from Hewlett-Packard, IBM, Sun, and DEC. The major teaching system, one of the most sophisticated and modern undergraduate teaching facilites in the world, is a network of 50 HP 320 DesignCenter computers.

The three teaching laboratories cover the fields of electric circuits, electronic circuits, and digital circuits. The following research and teaching laboratories are used in the undergraduate program:

Digital Digital systems. Microprocessors. HP 64000 Microprocessor Development Systems. Digital signal processing. TMS 320 development systems.

Microelectronics Device and IC fabrication. Device characterization. Process and device simulation. Parameter extraction. VLSI design.

Microwaves and Communications Spectral and network analysis. HP 8753 Vector Network Analyzers. Touchstone super compact, Analog Workbench CAD/CAE software on IBM AT and HP 320. Device design, construction, and measurement.

Robotics and Servomechanisms Hamerslag robot arms. Electromechanical measurements. Servosystems. Computer graphics. HP 61000 instrument systems.

Storage Technology Recording head models and measurements. Recording channel electronics. Recording media measurements and testing. The read/write process.

Graphics Image processing. Sun 300. Silicon Graphics 2400 Systems. Gould DeAnza system on VAX 750.

LOWER-DIVISION COURSES

4. Introduction to Programming I

Introduction to computer organization and operating systems. Structured algorithmic approach to problem solving using Pascal. Programming techniques such as top-down or stepwise refinement. Specification writing and the importance of documentation and self-documenting code. (4 units)

5. Introduction to Programming II

Advanced programming techniques. Separate compilations. Program development tools and environments. Programming in the small and programming in the large. Continuation of EECS 4. *Prerequisite: EECS 4.* (4 units)

22. Machine Organization and Programming

Assembly-language programming. Introduction to computer architecture. Number systems and representation; memory organization, computer organization; computer arithmetic; input/output. Impact of computer hardware on software. Introduction to assembler techniques. *Prerequisite: EECS 4 or Math 10.* (4 units)

23. Programming in C

Introduction to systems programming using the C programming language. Automated program-building and separate compilation. Programming tools such as

MAKE and LINT. Principles of modularity, encapsulation, and abstraction. *Prerequisites: EECS 4 and 22.* (4 units)

50. Electric Circuits I

Physical basis and mathematical models of circuit components and energy sources. Circuit theorems and methods of analysis are applied to DC and AC circuits. Laboratory. *Prerequisite: Physics 6; co-requisite: AMTH 106.* (5 units)

70. Data Structures

Specification, representation, and implementation of data structures using a high-level programming language. Data and procedural abstraction. EECS 70 and Math 61 cannot both be taken for credit. *Prerequisites: EECS 5 and 22.* (4 units)

72. File Organization

Storage structure and management. Basic file organizations: sequential, direct, hashed, indexed, hybrid. External sorting and searching. Continuation of EECS 70. *Prerequisite: EECS 179 or Math 163.* (4 units)

79. Discrete Mathematics

Relations and operations on sets, orderings, elementary combinatorial analysis, recursion, algebraic structures, graphs. (4 units)

UPPER-DIVISION COURSES

100. Electric Circuits II

Continuation of EECS 50, including sinusoidal steady state and phasors, transformers, three-phase circuits, resonance, Laplace analysis, transfer functions. Fourier Series. Laboratory. *Prerequisite: EECS 50 or Physics 70.* (5 units)

104. Electromagnetics I

Static electric and magnetic fields and their sources and effects, including potential theory and the laws of Coulomb, Lorentz, Faraday, and Gauss. Introduction to vector analysis and differential operators. Dielectric and magnetic materials, capacitance and inductance, energy in magnetic and electric fields, solutions to the Poisson equation. *Prerequisites: Physics 6 and EECS 50; co-requisite: EECS 100.* (4 units)

105. Electromagnetics II

Time harmonic electromagnetic fields. Introduction to complex vector operations. Maxwell's equations and the laws of Faraday and Gauss. Conservation of charge and power, Poynting vectors. Helmholtz wave equation, wave propagation. Boundary conditions and wave reflection and propagation, Snell's law. Transmission line theory, introduction to the Smith chart. Waveguides and radiation. *Prerequisite: EECS 104 or Physics 111.* (4 units)

107. Magnetic Recording Theory

Magnetic field theory and properties of magnetic materials applied to magnetic head design, the recording process, reciprocity, pulse and frequency response characteristics, and the magnetic recording channel. *Prerequisite: EECS 104 or Physics 111.* May be taken for graduate credit up to 12 units. (4 units)

109. Applications of Electromagnetics

Review of Maxwell's equations. Circuit elements and circuits. Non-ideal transmission lines. Boundary value problems. Conformal transforms. Waveguides. Resonant cavities. Microwave networks. Microwave materials. *Prerequisite: EECS 105.* (4 units)

110. Linear Systems

Signal and system modeling, time and frequency domain analysis, and application of the Fourier and Laplace transforms to system analysis. State variable techniques, discrete time signals and systems, digital filters and the discrete and fast Fourier transforms. Laboratory. *Prerequisite: EECS 100.* (5 units)

111. Analysis of Linear Networks and Systems

Review of matrix algebra, elementary network topology, matrix foundation of system equations including network theorems, Laplace transform techniques, sinusoidal steady-state and frequency analysis. Computer-aided analysis and design. *Prerequisite: EECS 100.* May be taken for graduate credit up to 12 units. (4 units)

112. Modern Network Synthesis and Design

Approximation, synthesis of passive one-port and two-port networks, linear operational amplifiers and active R-C synthesis. Nonlinear operational amplifiers: phase-locked loops, waveform generation. Design project. *Prerequisite: EECS 110.* May be taken for graduate credit up to 12 units. (5 units)

114. Introduction to Topological Analysis

Introduction to topological analysis of linear networks and systems. Elementary network topology; planarity and duality; topological analysis of linear one-ports and two-ports; symbolic functions and sensitivity analysis; computer-aided topological analysis and optimization; introduction to topological synthesis and design. *Prerequisite: EECS 100.* (4 units)

115. Electronic Circuits I

Introduction to semiconductor devices and circuits, including diodes and bipolar and field-effect transistor circuits. The ideal operational amplifier with circuit applications. Introduction to device modeling, biasing, and small-signal amplifiers. Emphasis on both analysis and design of semiconductor circuits. Laboratory. *Prerequisite: EECS 100.* (5 units)

116. Electronic Circuits II

Continuation of EECS 115. A review of bipolar junction transistor and field-effect transistor models. Analysis and design of single- and multiple-stage transistor analog amplifiers, including frequency response. Laboratory. *Prerequisite: EECS 115.* (5 units)

117. Electronic Circuits III

Continuation of EECS 116. Analysis and design of output stages and power amplifiers, tuned amplifiers, and oscillators. Introduction to negative feedback and the four basic feedback topologies. Bipolar and MOS digital logic circuits. D/A and A/D conversion techniques. Laboratory. *Prerequisite: EECS 116.* (5 units)

119. Current Topics in Electrical Engineering

Various subjects of current interest. May be taken more than once if topics differ. (4 units)

121. Digital System Design and Analysis

Basic switching circuit and logic design concepts. Survey of digital logic hardware families, including TTL, CMOS and ECL for SSI, MSI and LSI circuit-building blocks. Numbering systems and Boolean algebra. Minimization techniques including Karnaugh maps, Variable Entered maps, and QM techniques. Combinational circuit design with MUXs, PLAs, ROMs. Sequential analysis of counters and shift registers. Laboratory includes design, development, and construction of digital circuits from "word-problem" statements. CAD approach to circuit design in lab. (5 units)

122. Computer Architecture

Overview of computer systems, CPU design, computer arithmetic, microprogramming techniques, design of main memory, memory hierarchies and management, input/output subsystem organization, interrupt handling and DMA channels. Laboratory projects include design and implementation of a CPU based on a bit-slice microprocessor. *Prerequisite: EECS 124.* (5 units)

124. Introduction to Microprocessors

Overview of microprocessor organization, hardware-software tradeoffs, survey of microprocessor architectures and assembly languages, LSI memory chips, memory section design, LSI I/O techniques, interrupts, DMA channels, microcomputer development systems. *Prerequisites: EECS 22 and 121.* (5 units)

127. Digital System Controller Design

Contemporary design of finite state machines as system controllers using MSI, LSI, and VLSI devices. Design of synchronous sequential systems, minimization techniques, performance analysis, and modular system design. Use of ROMs and PLAs for controllers. Design and analysis of asynchronous systems. Laboratory requires design, construction, and testing of controller from verbal specs. CAD design tools are used. *Prerequisite: EECS 121.* (5 units)

128. Computer Graphics Systems

Interactive graphic systems. Graphics primitives, line and shape generation. Simple transforming and modeling. Efficiency analysis and modular design. Interactive input techniques. 3D transformations and viewing, hidden surface removal. Color graphics, animation, real-time display considerations. Parametric surface definition and introduction to shaded-surface algorithms. *Prerequisites: EECS 5 and Math 53.* (4 units)

129. Current Topics in Computer Science

Various subjects of current interest. May be taken more than once if topics differ. (4 units)

130. System Control and Design

Description of dynamic systems, state-space and input-output modes. Controllability and observability. Minimal realizations and design. Linear feedback. Performance measures and sensitivity. Stability: frequency and analysis, root-locus. Lead-lag compensation design. State-variable and optimization design. Laboratory. *Prerequisite: EECS 110.* May be taken for graduate credit up to 12 units. (5 units)

133. Digital Signal Processing

Description of discrete signals and systems. Difference equations. Convolution summation. Z-transform, transfer function, system response, stability. Discrete Fourier transform. Frequency characteristics. Digital filter design. State-space design. Laboratory. *Prerequisite: EECS 110.* May be taken for graduate credit up to 12 units. (5 units)

134. Applications of Digital Signal Processing

Course extends digital signal processing and digital filtering theory to modern applications. Design and analysis of digital filters and processing used in telephone systems digital audio and compact disc recording, and medical imaging. Implementations with special-purpose microprocessors and parallel architectures analyzed for real-time operations. *Prerequisites: EECS 133 and 141.* (4 units).

141. Communication Systems

Signal description; Fourier transforms; filtering; noise description; linear, exponential, and pulse modulation and demodulation. Laboratory. *Prerequisite: EECS 110.* May be taken for graduate credit up to 12 units. (5 units)

144. RF and Microwave Components

Study of passive and active electrical components used in radio frequency and microwave circuits. Emphasis on fundamental characterization of components. Parasitics, models, and measurements. Resistors, inductors, capacitors, transmission lines, diodes, transistors. *Prerequisite: EECS 105.* (5 units)

145. RF and Microwave Circuits

Design, construction, and testing of typical RF and microwave circuits including filters, amplifiers, and oscillators. System

measurements. *Prerequisite: EECS 144.* (5 units)

151. Semiconductor Devices I

Materials properties, crystal structure, and band structure of semiconductors. Carrier statistics and transport. pn junction statics, I-V characteristics, equivalent circuits, and switching response. Metal-semiconductor contacts, Schottky diodes. Metal-semiconductor field-effect transistors, junction field-effect transistors. Laboratory. *Prerequisites: Physics 7 and EECS 104 and 115.* (5 units)

152. Semiconductor Devices II

Metal-oxide-semiconductor field-effect transistors, bipolar junction transistors, heterojunctions. Principles of silicon IC fabrication processes and design. Bulk and epitaxial crystal growth, thermal oxidation, diffusion, ion implantation. Process simulation for basic devices. *Prerequisite: EECS 151.* (5 units)

153. Integrated Circuit Design

Integrated components. Monolithic linear and digital IC design techniques. Analyses of amplifier, logic, and memory circuits. Use of CAD tools for IC design and analysis. *Prerequisite: EECS 152.* (5 units)

154. Integrated Circuit Fabrication and Characterization

Principles and practice of IC fabrication and characterization of basic semiconductor devices with experiments on oxidation, diffusion, ion implantation, lithography, etching and cleaning, metallization, film deposition, process simulation, process integration, and parameter extraction. Conducted in the Microelectronics Laboratory clean-room facility. *Prerequisite: EECS 152.* (4 units)

160. Principles of Electrical Machines

Analysis of specialty machines used in control systems such as voice coil motors, stepping motors, and P.M. motors. Introduction to electronic drive systems as applied to motor control. *Prerequisite: EECS 100.* (5 units)

161. Advanced Electrical Machine Theory

Principles of electrical machines. Introduction to magnetic circuits, induction machines, and three-phase synchronous machines. *Prereqisite: EECS 100.* (5 units)

162. Electric Power Systems

Systems that transmit electric energy from the point of generation to the point of use. Three-phase systems. Faults. Load flows. System modeling for computer solutions. *Prerequisite: EECS 100 or equivalent.* May be taken for graduate credit up to 12 units. NCX† (4 units)

164. Introduction to Power Electronics

Development of models utilizing semiconductor materials used in high-current and/or high-voltage applications. Models include DC to DC converters, AC to DC converters, and DC to AC inverters. Analysis of power amplifiers. SPICE implementations of models. *Prerequisite: EECS 115.* (5 units)

171. Principles of Design and Implementation of Programming Languages

High-level programming language concepts and constructs. Costs of use and implementation of the constructs. Issues and tradeoffs in the design and implementation of programming languages. Critical look at several modern high-level programming languages. *Prerequisite: EECS 70 or Math 61.* (4 units)

†Exempted from challenge

172. Structure and Interpretation of Computer Programs

Techniques used to control complexity in the design of large software systems. Design of procedural and data abstractions; design of interfaces that enable composition of well-understood program pieces; invention of new, problem-specific languages for describing a design. Programs written and run in a dialect of LISP. *Prerequisite: EECS 70 or Math 61.* (5 units)

173. Logic Programming

Application of logic to problem solving and programming; logic as a language for specifications, programs, data bases, and queries; separation of logic and control aspects of programs; bottom-up reasoning (forward from assumptions to conclusions) versus top-down reasoning (backward from goals to subgoals) applied problem solving and programming; nondeterminism, concurrency, and invertibility in logic programs. Programs written and run in Prolog. *Prerequisite: EECS 70 or Math 61.* (4 units)

174. Introduction to Software Engineering

Systematic approaches to program design, project management, implementation, documentation, and maintenance. Software design methodologies. Structured programming, top-down implementation schemes, and stepwise refinements. Debugging, monitoring, and maintenance techniques. *Prerequisite: EECS 70 or Math 61.* (5 units)

175. Introduction to Formal Language Theory and Compiler Construction

Introduction to formal language concepts: regular expressions and context-free grammars. Compiler organization and construction. Lexical analysis and implementation of scanners. Top-down and bottom-up parsing and implementation of top-down parsers. An overview of symbol table arrangement, run-time memory allocation, intermediate forms, optimization, and code generation. *Prerequisite: EECS 70 or Math 61.* (4 units)

176. Software Tools Design

The design techniques for building good software tools. The concepts of filters, pipes, files, program arguments, and other facilities that make basic tools work well together. Students are expected to learn by examining and modifying existing tools. Programming assignments are required in C language running under a UNIX environment. *Prerequisite: EECS 70 or Math 61.* (5 units)

177. Operating Systems

Introduction to operating systems organization. Management of memory, processors, and other system resources, deadlock problems, and avoidance. Process interaction and communication. Sharing and protection of processes and data. File structures. Implementation considerations. *Prerequisite: EECS 70 or Math 61.* (4 units)

178. Introduction to Data-Base Systems

File organization. Hierarchical, network, and relational data models. Data-base design techniques based on integrity constraints and normalization. Data-base languages; protection backup and recovery, concurrency control. *Prerequisite: EECS 70 or Math 61.* NCX† (4 units)

179. Theory of Algorithms

Preliminaries: measuring work done by algorithms. Nonnumerical algorithms: searching, sorting, graph spanning and traversal, string matching. Numerical topics: polynomial and matrix arithmetic. P and NP completeness. *Prerequisites: EECS 79, Math 51 or 52, and EECS 70 or Math 61.* (4 units)

†Exempted from challenge

180. Introduction to Information Storage

Storage techniques and mass storage devices. Use of memory in computer systems. Design of semiconductor, magnetic and optical (disk drives), and magnetic tape memories. Storage controllers, computer interfaces, system software interfaces. Emphasis on current mass storage devices and interfaces: SCSI, IPI, ST506, ESDI. *Prerequisites: EECS 22 and 121; EECS 122 recommended.* (4 units)

188. Co-op Education I

Integration of classroom study and practical experience in a planned program designed to give students practical work experience relating to their academic field of study and career objectives. Alternate or parallel periods of classroom study with periods of training in industry and government. Work includes overall report on assignment activities. P/NP grading. May be taken twice. May be taken for graduate credit. Additional fees required. (2 units)

189.Co-op Education II

Credit given for a technical report on a specific activity such as a design or a research project, etc., after completing the co-op assignment. Approval of department co-op adviser required. Letter grades based on content and presentation quality of report. May be taken twice. May be taken for graduate credit. (2 units)

194. Design Project I

Specification of an engineering project, selected with the mutual agreement of the student and the project adviser. Complete initial design with sufficient detail to estimate the effectiveness of the project. Initial draft of the project report. *Prerequisite: English 182.* (2 units)

195. Design Project II

Continued design and construction of the project, system, or device. Initial draft of project report. *Prerequisite: EECS 194.* (2 units)

196. Design Project III

Continued design and construction of the project, system, or device. Final report. *Prerequisite: EECS 195.* (2 units)

199. Independent Study

Open to department scholars only. (1–6 units)

SCHOOL OF ENGINEERING
MECHANICAL ENGINEERING

Professors Emeriti: R. Ian Murray, Richard K. Pefley
Professors: Mark D. Ardema, Kenneth E. Haughton, Michel A. Saad, Terry E. Shoup, James W. White
Associate Professors: Eugene J. Fisher, Timothy K. Hight
Assistant Professors: Vayakumar Ponnaganti, T. Gary Yip
Adjunct Professor: Joseph T. Ma
John M. Sobrato Professor: Terry E. Shoup

Mechanical Engineering includes all aspects of design, development, control, and manufacture of mechanical systems and energy conversion systems. The undergraduate curriculum addresses itself to the education and training of mechanical engineering students and concentrates on two technical areas: (1) design and analysis of thermofluid systems for effective utilization of energy; and (2) design, analysis, and control of mechanical systems including the study

of materials used in engineering. Educational efforts are channeled to expand the skills of prospective engineers not only in understanding fundamentals but also in developing competence in analyzing engineering systems.

LOWER-DIVISION COURSES

10. Introduction to Engineering Graphics

Principles of orthographic projection, dimensioning, sectioning, isometric and auxiliary views. Descriptive geometry applied to representation and visualization. Computer-aided design through use of engineering workstations. (3 units)

11. Machine Tool Processes

Material properties and changes of these properties during processing. Use of machine tools to produce various mechanical items. Laboratory. (5 units)

15. Introduction to Material Science

Physical basis of the electrical, mechanical, and thermal behavior of solids. Relations between structural and physical properties. Theory of dislocations, vacancies, and other defects and their effect on physical properties. Illustrations of the relationships among material selection, manufacturing processes, and design. Laboratory. *Prerequisites: MECH 11 and Physics 6.* (5 units)

UPPER-DIVISION COURSES

114. Machine Design I

(Formerly MECH 115.) The decision-making process in the solution of problems. Stress and deflection analysis are emphasized in the first portion of the course. Strength criteria is considered in the second portion. One or two open-ended design projects are employed during the term. *Prerequisites: MECH 15 and CENG 43.* (4 units)

115. Machine Design II

(Formerly MECH 116.) Continuation of the study of machine components applied to the solution of practical mechanical design problems. Design of components to withstand static and fatigue loading. *Prerequisite: MECH 114.* (4 units)

116. Introduction to Design

(Formerly MECH 114.) Fundamentals of engineering design including design philosophy, problem definition, information gathering, idea generation, decision-making, creativity, aesthetics. Short design projects used to convey these ideas. *Prerequisite: MECH 115.* (4 units)

121. Thermodynamics I

Properties of pure substances. Work and heat. First and second laws of thermodynamics. Application to fixed mass systems and control volumes. Irreversibility and availability. *Prerequisite: Physics 6.* (4 units)

122. Fluid Mechanics I

Fluid properties and definitions. Fluid statics, forces on submerged surfaces, manometry. Streamlines and the description of flow fields. Euler's and Bernoulli's equations. Mass, momentum, and energy analysis with a control volume. Laminar and turbulent flows. Losses in pipes and ducts. Dimensional analysis and similitude. Laboratory. *Prerequisite: CENG 42.* (5 units)

123. Heat Transfer

Introduction to the concepts of conduction, convection, and radiation heat transfer. Application of these concepts to engineering problems. *Prerequisites: MECH 121 and 122.* (4 units)

131. Thermodynamics II

Thermodynamic potentials and availability concepts. Thermodynamic cycles. Nonreactive mixtures. Reactive mixtures with emphasis on the thermodynamics of combustion and chemical equilibrium. Laboratory. *Prerequisite: MECH 121.* (5 units)

132. Fluid Mechanics II

Introduction to gas dynamics. Concepts of lift and drag. Mechanics of laminar and turbulent flow. Introduction to boundary-layer theory. Application to selected topics in lubrication theory, aerodynamics, turbomachinery, and pipe networks. *Prerequisites: MECH 121 and 122.* (4 units)

133. Thermofluid System Design

Evaluation and selection of thermofluid system components such as compressors, fans, heat exchangers, internal combustion engines, and turbines. Application of mathematical, economic cost techniques and availability analysis to the synthesis, design, and evaluation of thermofluid system projects. Emphasis on an actual design project. *Prerequisites: MECH 123, 131, and 132.* (4 units)

140. Intermediate Dynamics

Motion in rotating reference frames. Angular momentum of rigid bodies. Moments and products of inertia. Gyroscopic motion. *Prerequisite: CENG 42.* (4 units)

141. Introduction to Linear Systems

Study of fundamental characteristics of linear systems via analysis of simple electrical and mechanical models. Forced and natural response. Introduction to Laplace transforms and their use in mechanical vibrations, circuit analysis, and electromechanical systems such as AC/DC motors. Laboratory. *Prerequisites: MECH 140 and AMTH 106.* (5 units)

142. Control Systems Analysis and Design

Modeling of physical systems. Analysis of linear feedback control systems by classical methods. Synthesis and design of control systems that satisfy certain stability and time response criteria. Introduction to analysis and design by state-space methods. *Prerequisite: MECH 141.* (4 units)

143. Electromechnical Systems and Components

Machine dynamics, transfer functions, and modeling of physical electromechanical systems. Applications and laboratory. *Prerequisites: MECH 141 and EECS 100.* (4 units)

151. Finite Element Theory and Applications

Basic introduction to finite elements; direct and variational basis for the governing equations; elements and interpolating functions. Applications to general field problems—elasticity, fluid mechanics, and heat transfer. Extensive use of software packages. *Prerequisites: EECS 4 and AMTH 106.* (4 units)

160. Mechanical Engineering Laboratory

Introduction to design of experiments, instrumentation, data acquisition, error analysis, and report writing. *Prerequisites: English 182, MECH 122, and senior standing.* (4 units)

188. Co-op Education I

Integration of classroom study and practical experience in a planned program designed to give students practical work experience relating to their academic field of study and career objectives. Alternate or parallel periods of classroom study with periods of training in industry and government. Work includes overall report on assignment activities. P/NP grading. May be taken twice. May be taken for graduate credit. Additional fees required. (2 units)

189. Co-op Education II

Credit given for a technical report on a specific activity such as a design or a research project, etc., after completing the co-op assignment. Approval of department co-op adviser required. Letter grades based on content and presentation quality of report. May be taken twice. May be taken for gradaute credit. (2 units)

190. Independent Study

Investigation of a mechanical engineering problem and presentation of the results. Arrangement with a faculty adviser is required. *Prerequisite: senior standing.* (2–4 units)

193. Computer Design Workshop

An interdisciplinary workshop in which engineering, art, and communication students learn to use graphics computers and software. Students work in teams to explore solutions to important social problems, use the computer to illustrate solutions, and complete formal presentations of their findings. Limited enrollment. *Prerequisite: permission of instructor.* (Also listed as Art 193 and Comm 193.)

194. Advanced Design I—Tools

Design tools basic to all aspects of mechanical engineering, including computer-design tools. CAD, finite element method, simulation, CAM/robotics, engineering economics, and decision-making. Senior design projects begun. *Prerequisite: MECH 116.* (4 units)

195. Advanced Design II—Implementation

Implementation of design strategy. Detail design and fabrication of senior design projects. Quality control, testing and evaluation, standards and specifications, and human factors. *Prerequisite: MECH 194.* (4 units)

196. Advanced Design III—Completion and Evaluation

Design projects completed, assembled, tested, evaluated, and judged with opportunities for detailed reevaluation by the designers. Final written report required. *Prerequisites: MECH 195 and English 182.* (4 units)

199. Directed Research

Investigation of an engineering problem and writing an acceptable thesis. Conferences as required. *Prerequisite: senior standing in Mechanical Engineering.* (2–4 units)

8

Division of Counseling Psychology and Education

Associate Professors: Charles J. Beirne, S.J., Kenneth E. Blaker, Ruth E. Cook, Brian P. Hall, Joyce E. King, Jerome A. Kroth, Dale G. Larson, Jerrold L. Shapiro, Jo Ann Vasquez *(Dean),* William W. Yabroff
Assistant Professor: Mary Anne Wakefield
Lecturers: Lee Mahon, Donald D. St. Louis

TEACHER EDUCATION AT SANTA CLARA

Santa Clara University is accredited by the California Commission on Teacher Credentialing to offer professional preparation for prospective elementary and junior and senior high school teachers. The Teacher Education programs at Santa Clara consist of the Multiple-Subject Credential (elementary grades) and the Single-Subject Credential (junior and senior high school levels). These credential programs are designed to provide extensive experience in schools as well as a diversified course of study in educational theory and practice. The Basic Teaching Credential program (multiple-subject or single-subject) can be completed as a fifth year of graduate study or as part of the four-year baccalaureate program.

Other credential programs offered by the Division of Counseling Psychology and Education include a Learning Handicapped Specialist Credential, a Resource Specialist Certificate, a Pupil Personnel Services Credential, and an Administrative Services Credential. Some credentials require first obtaining a basic teaching credential. The California Preparation and Licensing Law of 1970, commonly referred to as the Ryan Act, the Hughes-Hart Reform Act of 1983 (SB-813), and the Teacher Education Bergeson Act (SB-148) guide policy in teacher preparation at Santa Clara.

Dr. Joyce E. King, Division of Counseling Psychology and Education, is the director of Teacher Education. The coordinator of Student Teaching is Dr. Gloria Ladson-Billings, also in the Division of Counseling Psychology and Education.

UNDERGRADUATE PREPARATION FOR CAREERS IN TEACHING

Preparation for the Multiple-Subject Credential Program

Students interested in a career in elementary school teaching should fulfill the requirements of the Multidisciplinary Studies/Pre-Teaching program in the College of Arts and Sciences. Dr. Rose Marie Beebe, Department of Modern Languages and Literatures, is coordinator of the Multidisciplinary Studies/Pre-Teaching program. For specific course requirements, refer to the Multidisciplinary Studies/Pre-Teaching program in this bulletin. Students who have not completed this approved waiver program may still qualify for admission to the Multiple-Subject Credential program by passing the National Teacher Examination (Core Battery).

Preparation for the Single-Subject Credential Program

Students interested in secondary teaching of a particular subject may fulfill the requirements of one of eight approved single-subject waiver programs at Santa Clara. These subject categories include biology, chemistry, combined sciences, English, history,* Spanish, French, and German. Students should indicate their interest in teaching to the appropriate adviser within their major and ask to see the *Academic Guide for Preteaching Majors.* Students who do not complete one of the approved single-subject waiver programs, but are interested in a teaching career, must instead pass the National Teacher Examination in the appropriate subject area(s). Those students interested in teaching a subject that is not listed here should contact the department chair for information.

California teaching credentials are also available in the following subject areas: agriculture, art, business, government,* health science,* home economics, industrial arts, life science, music, physical education, physical science, and social science. Students who wish to obtain a credential in an area for which Santa Clara does not offer an approved single-subject waiver program must pass the National Teacher Examination in that subject.

Minimum Requirements for the Multiple- and Single-Subject Credentials

The minimum requirements for each teaching credential include (1) a baccalaureate or higher degree in a subject area (not in professional education) from an accredited institution; (2) completion of an approved program of professional education, including student teaching; (3) completion of a state-approved subject area major or passage of a subject area examination (in the area one plans to teach); (4) demonstration of a knowledge of the various methods of teaching reading by completion of course work or passage of an approved examination; and (5) passage of the California Basic Educational Skills Test (CBEST).

Information regarding the National Teacher Examination is available from the Division of Counseling Psychology and Education, 213 Bannan Hall.

*No examination available

A *Clear Teaching Credential* may be earned by meeting the minimum requirements plus the additional requirements of a fifth year of study; a course in health education, a course in teaching children with exceptional needs in the regular classroom, approved course work in computer education, and course work or an examination on the provisions and principles of the U.S. Constitution. History 7 or 171 or Political Science 1 or 157 satisfies the U.S. Constitution requirement.

Note: Students are encouraged to complete an approved health education course prior to enrollment in the credential program. Contact the Division of Counseling Psychology and Education, 213 Bannan Hall, for information.

THE FOUR-YEAR CREDENTIAL PROGRAM

The Multiple-Subject or Single-Subject Credential program can be taken at Santa Clara in a student's senior year. Students who complete all the University and major requirements by the end of their junior year are eligible to apply for entrance to the Teacher Education program during their senior year. Upon graduation from Santa Clara after four years of study, these students will obtain a *Preliminary Teaching Credential.* Since a *Clear Teaching Credential* requires an additional fifth year of study, these students must complete an additional 45 quarter units of an approved program within five years. Courses and requirements for four-year students and students completing a credential program in their fifth year of study are the same.

THE FIFTH-YEAR CREDENTIAL PROGRAM

The Multiple-Subject or Single-Subject program is generally taken as a fifth year of study following baccalaureate and therefore qualifies the student for a *Clear Teaching Credential.* This 45-quarter-unit program includes graduate course work in educational foundations, curriculum design, teaching methods, and supervised student teaching. For further information, consult *Counseling Psychology and Education Graduate Programs.*

ADMISSION REQUIREMENTS

Admission requirements for the credential program are as follows:

1. Academic achievement: applicants should have an overall grade point average of 2.75, with a 3.0 in the academic major;
2. A positive attitude toward the teaching profession and its responsibilities;
3. Demonstrated competence in reading, writing, and speaking English as attested to by course work, a recently written paper, or a recommendation from the applicant's major adviser;
4. Absence of criminal conviction that would preclude the issuance of a teaching credential;

5. Letters of recommendation from the following:
   a. At least one professor from the student's major field (preferably the student's major adviser)
   b. A teacher who has supervised the student's practicum work in the elementary or secondary school
   c. An employer or professional colleague who is well acquainted with the student's skills in working with youth;
6. Verification of successful practicum work and/or experience with children or youth groups;
7. An interview with both the director of Teacher Education and other faculty members;
8. A written statement, which may be completed at the time of the interview, that reflects the candidate's personal philosophy of education and commitment to the teaching profession;
9. Submission of recent GRE or GMAT test scores and CBEST scores.

It is highly recommended that applicants complete the subject matter requirement either through a waiver degree program or by passing the NTE before beginning a credential program.

Applicants to the credential program may apply any time between December 1 and May 1 for admission the following September. Application forms are available from the Division of Counseling Psychology and Education, 213 Bannan Hall.

EARLY ADMISSION FOR SENIORS

Early admission to the fifth-year credential program is available to seniors who wish to apply during the fall quarter. Applications are processed as soon as the student's file is complete. Students receive early notification of admission for the following September and are assured a place in the program. Applications are accepted any time after October 1.

Since the Teacher Education program is limited in enrollment, accepted candidates must reserve a place in the program by depositing $50 before June 1. This nonrefundable deposit will be applied to the candidate's tuition.

THE PAUL DOUGLAS TEACHER SCHOLARSHIP PROGRAM

The Paul Douglas Teacher Scholarship Program, formerly the Congressional Teacher Program, is an incentive program designed to attract and commit students to the teaching profession. The program awards up to $5,000 per year for a maximum of four years. Eligible students are freshmen, sophomores, juniors, seniors, and fifth-year students who are enrolled in an approved curriculum leading to a teaching credential. Information about this program is available from the Division of Counseling Psychology and Education 213 Bannan Hall.

COURSE DESCRIPTIONS

The Division of Counseling Psychology and Education offers the following courses for undergraduates. Consult *Counseling Psychology and Education Graduate Programs* for a description of courses in the credential programs.

EDUCATION

98/198.01. Introduction to Elementary School Teaching: Practicum

98/198.02. Introduction to Secondary School Teaching: Practicum

Opportunity to work as teacher aides in elementary and secondary classrooms. Weekly seminars and directed readings address field-related problems and issues, classroom dynamics, and curriculum. These courses are offered each quarter.

119. Psychology of Education

Psychological principles on which effective classroom practices can be based. Human growth and development, learning theory and practice, motivation and management, effective instruction, and evaluation. Development of psychological case studies as part of the field experience. Open to sophomores.

138. The Exceptional Child

Introduction to childhood mental retardation, learning disabilities, behavior disorders, communication (speech and language) disorders, hearing impairments, physical and health impairments, severe handicaps, and the gifted and talented. The impact of these differences in comparison with normal development. Visits to institutions that serve these children. Particularly applicable for students interested in careers in social work, rehabilitation, education, medicine, psychology, counseling, and parenting.

163. Introduction to Teaching in a Multicultural Society

Exposure to the diversity of cultures present in America's public schools. Alternative instructional approaches and learning styles. Discussion of issues such as bilingual/bicultural education, cross-cultural/intercultural communication, and multicultural curriculum in conjunction with field experiences in local public schools. *Satisfies the multicultural perspective requirement.* Open to sophomores.

COUNSELING PSYCHOLOGY

140. Psychology of Intimacy

Specifically designed to investigate the needs for, and difficulties in, finding and maintaining intimate relationships in modern culture. Using their own family backgrounds as a basis, students explore the nature, scope, and communication involved in psychological intimacy. Common blocks and fears of intimate relating are described and traced. Novel approaches to finding and keeping intimate partnerships are discussed.

9

University Programs

HONORS PROGRAM

The Honors Program enables superior students to pursue an especially challenging curriculum while majoring in any of the undergraduate departments in the University. It is not in itself a major program. Typical Honors Program students do approximately one-fourth of their course work in special Honors courses limited to about sixteen students.

Most Honors work is completed during the freshman and sophomore years; the junior and senior years are occupied principally by intensive work in the student's major department. Various pass/not pass options, exemptions from course-load limitations, and registration privileges enable students in the program to design curricula suited to their abilities, preferences, and educational needs.

Criteria for admission to the Honors Program include high school academic records, Scholastic Aptitude and Achievement Test scores, letters of recommendation, and, when possible, interviews with the director of the program. A high school grade point average of 3.5 and an SAT score of 1350 (including 650 verbal score) are the ordinary minimum requirements for acceptance into the program, although acceptance does not rest on scores alone.

Approximately 30 to 40 freshmen are admitted to the program every year. To remain in the program, students must maintain a cumulative grade point average of 3.0 and satisfy the director that, in other ways too, they are doing work of Honors caliber.

The University also has established a scholarship for Honors students to study at Oxford University during their junior year. The Oxford scholarship is a competitive award based on compatibility with the educational objectives of the applicants and on demonstrated academic excellence.

The awards Honors at Entrance and Acceptance with Distinction, which the University presents to high school students at high school commencement ceremonies, do not constitute admission or imply that the recipient will be admitted to the University Honors Program, nor are they related to the Honors Program in any other way.

Inquiries concerning the Honors Program should be sent to the Director, University Honors Program, Santa Clara University, Santa Clara, California 95053.

UNIVERSITY INSTITUTES

The University offers institutes that include multidisciplinary or related courses on a theme developed by faculty members from different disciplines in the College of Arts and Sciences, the Leavey School of Business and Administration, and the School of Engineering. In addition to academic courses, institutes usually include public lectures, dramatic productions, films, and social events. The University sponsored the Institute on War and Conscience and the Institute on the Family in fall 1982 and winter 1984, respectively. The Institute on Poverty and Conscience took place in winter 1985, followed by the Institute on Technology and Society in winter 1986 and the Institute on the Bicentennial of the United States Constitution in winter 1987. The Institute on Ethics is planned for winter 1990.

STUDIES ABROAD

Richard T. Coz, S.J., M.A. *(Director)*

Santa Clara University provides opportunities for study in Europe and Asia. The University is an affiliate of the Institute of European Studies with programs at Durham, London, Nantes, Paris, Madrid, Vienna, and Freiburg im Breisgau, Milan, and Singapore. In addition, the University is affiliated with Loyola University of Chicago in Rome and Gonzaga University in Florence and has a student exchange agreement with Ecole Superieure de Commerce de Rouen, France. Santa Clara also has an international business program and an Asian studies program through Hong Kong University and through Sophia University in Tokyo. A special program at Oxford University is open only to students in the University Honors Program. Students receive academic credit for work done through affiliated programs. All applicants must currently be enrolled at the University. Students must have junior status and the approval of the director of Studies Abroad for admission to these programs.

ETHNIC STUDIES

Gary Y. Okihiro, Ph.D. *(Director)*

The Ethnic Studies program offers interdisciplinary courses and coordinates the ethnic studies courses offered by academic departments. It also assists the academic departments in developing ethnic studies courses integral to the departmental curriculum. The program offers minority students an opportunity to study and understand their own cultural heritage and nonminority students an opportunity to understand and appreciate minority cultures in American society. The program sponsors other educational activities and serves as a resource to the campus community.

LOWER-DIVISION COURSES

20. Chicano Culture

Multidisciplinary survey of Chicano culture. Mexican cultural heritage and traditional folk culture. Chicano world views and values, religious beliefs, the family and kinship, language, and contemporary community issues of identity, sex roles and stereotyping, immigration, housing, employment, and education.

30. Afro-American Culture

Multidisciplinary survey of Afro-American culture. African cultural heritage and African survivals. World views and values, religious beliefs, the family and kinship, language, and contemporary community issues of identity, sex roles and stereotyping, housing, employment, and education.

40. Asian American Culture

Multidisciplinary survey of Asian American culture. Asian cultural heritage, immigration, and the formation of Asian American culture. World views and values, religious beliefs, the family and kinship, language, and contemporary community issues of identity, sex roles and stereotyping, housing, employment, and education.

90. Racism in the United States

Multidisciplinary study of racism in the United States. Its historical manifestations from the arrival of Europeans in North America to contemporary times, its psychological dimensions (prejudice, stereotypes, discrimination), and its place in the U.S. political economy (capitalism). Emphasis on Afro-Americans, but also discussion of Native Americans, Chicanos, and Asian Americans.

UPPER-DIVISION COURSES

120. Topics in Chicano Studies

Selected topics in Chicano studies from a multidisciplinary perspective.

130. Topics in Afro-American Studies

Selected topics in Afro-American studies from a multidisciplinary perspective.

140. Topics in Asian American Studies

Selected topics in Asian American studies from a multidisciplinary perspective.

190. Topics in Ethnic Studies

Selected topics in ethnic studies from a multidisciplinary perspective.

DEPARTMENTAL COURSES

35. Afro-American Literature

See English 35.

40. Social Forces in Politics

See Political Science 40.

81. Chicanos in the Southwest

See History 81.

83. Asian Americans

See History 83.

86. Native American Cultures

See Anthropology 86.

91. Slave Narratives

See Religious Studies 91.

109. African Americans and Africa

See History 109 (World and Comparative History).

126. Black Theology in the U.S.

See Religous Studies 126.

132. Social Stratification
See Sociology 132.

133. Mexican American Literature
See Spanish 133.

153. Ethnic Politics
See Political Science 153.

153. Minority Women in the United States
See Sociology 153.

163. Introduction to Teaching in a Multicultural Society
See Education 163.

166. Pan-African Literature
See English 166.

175. Race and Inequality
See Sociology 175.

180. North American Indians
See History 180.

187. Peoples and Cultures of the West Coast
See Anthropology 187.

WOMEN'S STUDIES

Mary McDougall Gordon, Ph.D. *(Director)*

The Women's Studies program offers both men and women students opportunities to study the experiences, contributions, and cultural images of women while working toward a degree in a traditional academic discipline. The program consists of courses given by various undergraduate departments. The program encourages the development of new courses and of faculty research specifically concerned with women. Its office serves as a resource center for the academic community.

DEPARTMENTAL COURSES

36. Gender in Human Development
See Psychology 36.

68. Women's Literature
See English 68.

72. Women in the Biblical Traditions
See Religious Studies 72.

88. Women in the Middle East
See Anthropology 88.

90. Cross-cultural Study of Women
See Anthropology 90.

121. Contemporary Social Theory
See Sociology 121. Topics occasionally include the Chicano family.

124. Women in Europe
See History 124.

135. Women and Social Change in Latin America
See Sociology 135.

144. Women in Islamic and African Societies
See History 144.

150. Twentieth-Century Novel
See German 150.

153. Minority Women in the United States

See Sociology 153.

154A. Women and Politics

See Political Science 154.

154B. Women in Asia

See History 154.

157. Family and Kinship

See Anthropology 157.

168A. Women's Literature

See English 168.

168B. Women's Religious Roles

See Religious Studies 168.

182A. Women in French Literature: Authors and Characters

See French 182.

182B. Family in American History

See History 182.

182C. Twentieth-Century Italian Women Writers

See Italian 182.

184A. Women in Antiquity

See Classics 184.

184B. Women in American Society

See History 184.

184, 185. Seminar in American Politics

See Political Science 184, 185. Occasional seminars offered in women in American politics.

189. History of Women Artists

See Art 189.

10

Special Programs

INTERNATIONAL BUSINESS

Tonia Caterina Riviello, Ph.D. *(Co-director)*
Michael E. Solt, DBA *(Co-director)*

The International Business program is designed to educate students in a broad range of management and international business skills and to offer them an understanding of the culture, history, and politics of a selected geographic area. Students must select one of three geographic specializations currently offered: Western Europe, Latin America, or East Asia.

The program is open to all undergraduates in the College of Arts and Sciences or the Leavey School of Business and Administration. Students may be admitted with approval of the program directors. Students entering the International Business program continue to major in their field of interest and will receive their bachelor's degree in that field. Ideally, students should enter the program during their freshman year, and they should seek counseling from the program directors early in their freshman year.

The program requires that students be proficient in a foreign language of their selected area. The requirement may be met either by passing an advanced exam administered by the Modern Languages Department or by completing the advanced-level course series (101-level in most cases). Proficiency in languages other than those offered by the University is acceptable only with approval of the program directors.

To develop a familiarity with the social, political, and economic institutions prevalent in their selected area, students take several courses in modern history, politics, anthropology, and contemporary culture. These courses must be selected from a list developed by the program directors for each geographic concentration.

Excellence in management requires familiarity with all dimensions of business and managerial life. Students develop this competence in required courses in accounting, economics, finance, marketing, and management. Students are also required to take a series of courses in international management, international marketing, and international economics, which focus on current practices and institutions of international trade and multinational business. These courses will be supplemented by seminars and lectures by members of the international community.

Because international trade and multinational business are surrounded by a variety of ethical issues and concerns, the program requires students to take a course in business or management ethics.

During their senior year, all International Business program students must take Management 162 (Strategic Management), a Capstone Course in the Leavey School of Business and Administration that fulfills the corresponding Leavy School of Business core requirement.

The directors of the International Business program encourage students to take advantage of the University's wide variety of programs for study abroad. With the approval of the program directors, some of the courses offered by the foreign programs may be counted toward partial fulfillment of the requirements for International Business. A list of required courses may be obtained from the International Business Office (202 O'Connor Hall) or from the program directors.

INTERNATIONAL STUDIES

Dennis R. Gordon, Ph.D. *(Director)*

International Studies is a University program within the College of Arts and Sciences. It was established to meet the needs of students who wish to concentrate course work beyond their majors in a multidisciplinary focus on selected topics of international significance. It is a supplement to, not a replacement of, the major. Completion of the program is noted on a student's graduating transcript.

A growing number of students are interested in exploring issues and subjects that are by nature international in scope and interdisciplinary in practice. This program coordinates courses and faculty expertise already available on campus, while also planning for the development of our resources, in order to enable students to pursue their international interests within an integrated and systematic course of study. Students have the opportunity to build on the strength of their major, organize courses that explore their chosen topic from a number of departments, and experience first-hand the interrelationships of ideas (and tension among perspectives) that underlie any understanding of international issues and global interdependence.

Students can organize their courses in either of two ways: with an *area studies* focus in one of three geographical areas (Western Europe, Latin America, or East Asia); or with a *thematic* focus of their own choosing, such as "poverty and development," "international politics, diplomacy, and law," or "peace studies."

The program provides students with an International Studies adviser with similar interests to help them choose courses that develop each of their interests and fulfill the basic requirements of the program.

Students must complete two upper-division language courses in a language deemed appropriate to their emphasis; one of three specified courses in the social sciences (Political Science 2, Political Science 25, or Anthropology 3); four courses (three should be upper division and only two in the major) in the chosen geographic or thematic emphasis; and a senior seminar offered through

the International Studies program. A list of the specific courses that can be used to fulfill the requirements is available from the International Studies Office.

MILITARY SCIENCE

Professor of Military Science: Lieutenant Colonel Jon C. Weber
Assistant Professors: Major Larry M. Hall, Captain Gregory E. Meyer, Captain Ronald A. Weigelt
Senior Enlisted Instructor: Master Sergeant Major George E. Davisson
Senior Training NCO: Sergeant First Class (P) Earnest D. Holifield

The University maintains a Senior Division of the Army Reserve Officers' Training Corps (ROTC). The program is specifically designed to give college men and women on-campus instruction and experience in the art of organizing, motivating, and leading others. It includes instruction on developing self-discipline, physical stamina, and bearing.

All courses offered by the Military Science Department are fully accredited and applicable toward fulfilling academic requirements for graduation. Through this voluntary program, the University offers all eligible students the opportunity to obtain an officer's commission in the U.S. Army Reserve, National Guard, or active Army, while earning their college degree.

ACADEMIC CURRICULUM

The Military Science core curriculum consists of nine lower-division classes in the ROTC Basic Course (Military Science 13, 15, 16, 20, 21, 22, 24, 27, 28) and seven upper-division courses in the ROTC Advanced Course (Military Science 133, 134, 135, 139, 143, 144, 145).

The professional military education of ROTC cadets consists of two essential components: a baccalaureate degree from Santa Clara University and at least one undergraduate course from each of five designated fields of study. Prior to commissioning, cadets must take at least one course in written communication, military history, human behavior, computer literacy, and math reasoning. ROTC cadets who have won scholarships must also take at least one class in a major Indo-European or Asian foreign language. The military history requirement may be satisfied by taking Military Science 45 or History 25 (Twentieth-Century World Wars).

Basic Course

The Basic Course, comprising the lower-division courses listed above, is normally taken during the freshman and sophomore years. Students may also satisfy the Basic Course requirements by taking Military Science 28. There is no military obligation incurred for participation in Basic Course classes.

Advanced Course

The Advanced Course consists of the seven upper-division courses listed above. Attendance at leadership laboratories is required, as well as satisfactory completion of a physical examination. Quarterly physical training tests are also required to remain in the Advanced Course.

Students who desire to enroll in the Advanced Course must apply and be accepted. Only those students who have satisfied ROTC Basic Course requirements and the requirements of Army regulations are eligible. For details of eligibility, see the ROTC enrollment officer, Varsi Hall.

LEADERSHIP LABORATORIES

Leadership laboratories are required for all Advanced Course and ROTC scholarship cadets. Performance during lab periods is reflected in the student's course grade. Labs include activities such as rappelling, terrain navigation, patrolling, marksmanship, drill and ceremonies, and tactical field training exercises. Other Basic Course students may attend labs on a voluntary basis.

ARMY ROTC SCHOLARSHIP PROGRAM

Army ROTC scholarships pay tuition, a flat rate allowance for books and supplies, and laboratory fees in addition to an allowance of $100 per month during the school year.

Scholarship recipients are expected to maintain acceptable standards of academic achievement and personal conduct. They must rank in the upper third of their Army ROTC class and continuously demonstrate leadership potential. The records of scholarship recipients will be reviewed each quarter by the professor of military science to determine eligibility for continued financial assistance.

Detailed information on the scholarship program may be obtained from the professor of military science at the University.

SIMULTANEOUS MEMBERSHIP PROGRAM

Advanced Course cadets may elect to join Reserve or National Guard units as officer candidates. Cadets receive pay and allowances from both ROTC and their assigned unit while gaining essential military knowledge prior to their commissioning. Cadets participating in this program can earn over $5,000 in two years.

EARLY COMMISSIONING PROGRAM

Students who complete all military science courses prior to award of their bachelor's degree may receive their commission early if they serve in a Reserve

or National Guard unit until graduation. Upon graduation, they may apply for active Army, Reserve, or National Guard duty.

COMMISSIONING IN THE U.S. ARMY RESERVE AND REGULAR ARMY

Students must complete the Advanced Course to be eligible for appointment and commissioning as officers in the U.S. Army Reserve. Reserve commmissions are tendered in all branches of the Army, except the Medical, Dental, Veterinary, Judge Advocate, and Chaplain Corps. A board of officers determines the branch in which students are commissioned based on their preference, leadership potential, and academic background, and the needs of the service.

A student who receives a bachelor's degree and has been designated a Distinguished Military Graduate by the president of the University and the professor of military science may, on graduation and approval of the Department of the Army, be commissioned directly in the Regular Army.

BASIC COURSES

Fundamentals of Leadership and Management

13. This Is Today's Army

Presents the role of the Reserve Officer Training Corps (ROTC) in U.S. Army national security missions. Organization, customs and traditions, and career opportunities available for today's university student in either the active or reserve components of the U.S. Army are introduced. (1 unit)

15. First Aid

Basics of lifesaving techniques including aiding burn victims, how to stop bleeding, aid for choking victims, mouth-to-mouth resuscitation, and cardiopulmonary resuscitation. Discussion of current societal health issues. (1 unit)

16. Modern Weaponry

An overview of the types, capabilities, and characteristics of modern weapons. Comparisons between U.S. and foreign nations' weapons including those of the Warsaw Pact nations. Review of large-caliber weapons such as tanks, artillery, and mortars. (1 unit)

Applied Leadership and Management

20. Map Reading and Land Navigation

Fundamental principles of map reading and land navigation. Military grid reference system, topographic symbols, and the use of marginal information. Application of intersection, resection, and modified resection. Students demonstrate proficiency in the following areas: locating features given a six-digit coordinate, converting grid to magnetic azimuths, and identifying terrain features. (2 units)

21. Mountaineering/Orienteering

Introduction to backpacking. Selection and use of equipment, proper nutrition, mountain medicine, rock climbing and rappelling, and the climbing environment. Particular attention to the approach/preparation phase of backpacking and rock climbing. (1 unit)

2. Master Fitness Training

ntroduction to basic and advanced con-epts of total body fitness. Lectures on eed for physical training for fitness, use f training equipment, aerobics, cardio-ascular training, muscle groups, and utrition. (1 unit)

4. Leadership

performance-oriented study of the eadership skills required to become an ffective leader and manager. The estab-ishment of a basis of knowledge to be uilt upon through practical application uring the Advanced Course. Particular mphasis on the importance of interper-onal skills, counseling, and group dy-amics. Also includes skills and tech-iques applicable to any business or nilitary organization. (2 units)

27. Strategy and Tactics

Overview of the conduct, characteristics, and implications of military operations. Various aspects of military action: mobility operations (airborne, amphibious), subsidiary operations, and revolutionary warfare. The principles of war are introduced and discussed. (2 units)

28. ROTC Basic Camp

Six weeks of full-time intensive training in leadership and management conducted at Fort Knox, Kentucky (no expense to students). Fulfills all ROTC Basic Course requirements through training received in fundamental military skills such as land navigation, drill and ceremonies, communications, rappelling, rifle marksmanship, first aid, and physical training. Taking the course does not obligate the student to military service but provides the student with exposure to life in the military. Pass/not pass. (4 units)

ADVANCED COURSES

Advanced Leadership and Management

133. Advanced ROTC Training I

detailed look at the utilization of Army ersonnel and equipment. Emphasis on nalysis of small unit operations and quipment. Students will apply teachings n regularly scheduled leadership labora-ories and filed training exercises. (2 nits)

134. Advanced ROTC Training II

Development of the skills and principles earned in Military Science 133. Course ncludes military history readings and ssays. Students required to prepare and ive oral presentations and briefings on elected military subjects. (2 units)

135. Advanced ROTC Training III

performance-oriented study of military communications equipment and techniques, small unit tactics, and leadership traits. Further study in selected subjects in military history also emphasized. (2 units)

139. ROTC Advanced Camp

Six weeks during the summer of full-time intensive training in leadership and management at Fort Lewis, Washington. Students thoroughly evaluated in their ability to lead a small unit and plan and conduct military operations. Attendance is normally between the junior and senior year. All expenses are paid and, additionally, students can earn over $700 during the six weeks. Those students who excel at Advanced Camp may be offered additional military training. (5 units)

Seminars in Leadership and Management

143. Professionalism and Ethics

Professionalism in today's Army and a study of military professional ethics. Emphasis on right and wrong conduct through case studies and historical analysis. (2 units)

144. Military Law

A detailed look at the military justice system, the Uniform Code of Military Justice (UCMJ), and the rights of individuals within the military. The Law of Land Warfare and the Geneva Convention are also discussed. (2 units)

145. Precommissioning/Preparation for Active Duty

Selected subjects pertinent to the preparation of the ROTC student for commissioning as an Army second lieutenant. Guest lecturers from active military installations present updated information on pay and allowances, travel pay and entitlements, health care, dependent status, and what to expect upon entry to active military duty.

Additional Required Courses

History 25. Twentieth-Century World Wars

A study of the causes, conduct, and results of World Wars I and II and their place in modern history. Civilian and military leadership and the chief campaigns and battles receive due attention. (Also listed as History 25.)

Military Science 45. U.S. Military History

Students will acquire a general knowledge and appreciation of the development of the U.S. military system from colonial times to the present. Course identifies and evaluates the important factors that influenced this development and the major changes that resulted. A knowledge of the principles of war that remain relatively constant and the elements of war that are modified by time enables students to better understand the evolutionary nature of warfare. (2 units)

RETAIL STUDIES

Dale D. Achabal, Ph.D. *(Director)*
David F. Caldwell, Ph.D. *(Associate Director)*

The Retail Studies program, offered through the Retail Management Institute, provides students with a realistic perception of the retailing industry. The program is open to all University undergraduates. The majority of the courses in the curriculum for the program are required for business majors. Arts and sciences majors can use general University requirements and electives to fulfill many of the curriculum requirements.

Students entering the Retail Studies program continue to major in their field of interest and receive their bachelor's degree in that field. Students completing the program receive a Certificate in Retail Studies.

The Retail Studies program curriculum includes lower-division courses in accounting, communication, computer concepts, and upper-division courses

in organization and management, marketing, and retail management. A seminar and an internship are included with the upper-division courses. A list of required courses may be obtained through the Retail Management Institute Office.

Nonbusiness majors are encouraged to apply for admission to the program during their freshman or sophomore year to allow time to integrate their course of study in retailing with their major field requirements. Business students who have completed the lower-division requirements will be able to enter the program as late as their junior year. To be admitted to the Retail Studies program, students must complete an application that will be reviewed by the Retail Management Institute faculty and staff. Applications are available in the Retail Management Institute Office, 108 St. Joseph's Hall (408-554-4960).

INSTITUTE FOR PARALEGAL EDUCATION

Emalie M. Ortega, J.D. *(Director)*

The School of Law administers the Institute for Paralegal Education. The institute offers a certificate program for persons interested in careers as paralegals in the legal profession and in law-related occupations. The certificate requires 48 units of credit in paralegal education. The units are professional growth credit and are not for academic credit. The institute operates on the quarter system. The program may be completed in one year as a full-time student or over two and three years as a part-time student. Both day and evening courses are offered. Students may take any class on an open-enrollment basis; however, entering certificate program students must meet certain general education requirements and should contact the director of the program for an interview prior to admission.

Students are required to take Introduction to Law, Principles of Law Practice, Summary of American Law, and Legal Research and Writing. Thereafter, they may generalize or concentrate in a major field of law. A component of specific courses provides training for paralegals interested in public sector work. A brief internship arranged by the director is a recommended part of the program. Limited transfer credit may be available for qualified students. The institute is approved for veterans' benefits. The institute is a member of the American Association for Paralegal Education and is in compliance with program guidelines set forth by the American Bar Association. The School of Law is accredited by the ABA; the institute does not pursue individual ABA approval.

For information contact the Institute for Paralegal Education, c/o Law House, Santa Clara, CA 95053 (408-554-4535).

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Academic Information

GENERAL GRADUATION REQUIREMENTS

Candidates for the degree of Bachelor of Arts (B.A.) or Bachelor of Science (B.S.) in the College of Arts and Sciences and the Bachelor of Science in Commerce (B.S.C.) in the Leavey School of Business and Administration must

1. Complete a minimum of 175 quarter units (Engineering Physics majors complete 193 quarter units and 45 term courses);
2. Complete a minimum of 12 upper-division courses, totaling at least 60 quarter units, after completing 88 quarter units;
3. Attain an average of C (2.0) in both their major and minor subjects and their total course load;
4. Meet the residency requirement of either (a) 45 units in the senior year or (b) 45 units in the junior year and 35 in the senior year;
5. Fulfill the education requirements of the University Curriculum; and
6. Fulfill the minimum course requirements of both their College or School and their major departments.

Candidates for the degree of Bachelor of Science (B.S.) in the School of Engineering must

1. Complete a minimum of 193 quarter units;
2. Complete 45 term courses;
3. Attain an average of C (2.0) in both their major and minor subjects and their total course load;
4. Meet the residency requirements of either (a) 45 units in the senior year or (b) 45 units in the junior year and 35 in the senior year;
5. Fulfill the educational requirements of the University Curriculum; and
6. Fulfill the minimum course requirements of both their College or School and their major departments.

Specific course requirements to meet each of these goals are outlined in the sections for each College or School.

Honors at Graduation

The candidate for an undergraduate degree who has a grade point average between 3.45 and 3.69 graduates cum laude; one who has a grade point average

between 3.70 and 3.89 graduates magna cum laude; one who has a grade point average of 3.90 or better graduates summa cum laude.

Honors will be based on all graded undergraduate courses attempted at Santa Clara University and elsewhere. Transfer students must complete at least two full years at the University to be eligible for honors, and no honors will be awarded above that merited by the student's record at Santa Clara. An indication of honors at graduation contained in the commencement program is unofficial. The final determination will be made after a review of all completed undergraduate courses.

A Second Bachelor's Degree

A student may earn a second bachelor's degree. For students whose first bachelor's degree is from Santa Clara, the conditions are (1) an academic record showing a strong probability of success in this undertaking; (2) a projected program of study that will amass at least 45 quarter units beyond the first bachelor's degree; (3) following the requirements in effect at the original matriculation date, provided the student is pursuing the second bachelor's degree without interruption (otherwise, the curriculum requirements in the *Undergraduate Bulletin* in effect at the time of re-entry); and (4) approval of the Committee on Admissions unless the second bachelor's degree is in the same college as the first, and it has been less than five years since the granting of the first bachelor's degree. If the candidate does not meet this last requirement it will be necessary to file a formal application for admission with the Office of Undergraduate Admissions. All other candidates who meet the requirements listed above should obtain the proper petition form through the Student Records Office.

All candidates whose first degree is from an institution other than Santa Clara must file a formal application for admission with the Office of Undergraduate Admissions and will be considered on a space-available basis. Candidates are subject to the curriculum requirements contained in the *Undergraduate Bulletin* in effect at the time of entry.

Financial aid other than student loans is normally not available to students seeking a second bachelor's degree.

A Second Major or an Academic Minor

A student may declare a second major or an academic minor by obtaining the approval of the appropriate chairs and dean or deans. The conditions governing the declaration of a second major or an academic minor and the required form may be obtained from the Student Records Office.

REGISTRATION

Registration materials must be obtained at the time and place announced by the University. All forms must be completed and returned as instructed. Financial arrangements for the payment of tuition and fees must be made prior to registration, or as otherwise announced by the University.

The University reserves the right to deny registration to any student for reasonable cause.

Student Classification

Students are classified by the number of quarter units they have completed with passing grades. Lower-division students are considered freshmen if they have completed fewer than 44 units, and sophomores when they have completed 44 but fewer than 88 units. Upper-division students are considered juniors when they have completed at least 88 but fewer than 131 units, and seniors when they have completed at least 131 units.

For academic purposes, students taking fewer than 12 units are considered part-time students. For tuition purposes, however, a part-time student is defined as a lower-division student taking fewer than three (3) term courses or an upper-division student taking fewer than two (2) term courses regardless of the unit value of the courses. Admission to the University as a part-time student requires approval of the Committee on Academic Status from the College or School that the student is currently attending or to which the student has applied. Six units is the minimum number of units to be considered enrolled at least half-time. Generally, students enrolled less than full-time, but at least half-time, may be eligible only for Stafford Loans.

Course Numbering System

Lower-division courses are numbered 1–99. Upper-division courses are numbered 100–199. Most undergraduate courses in the College of Arts and Sciences and the Leavey School of Business and Administration carry 4 or 5 units of academic credit. In the School of Engineering, course values range from 3 to 5 units each.

ACADEMIC ADVISING

Each incoming student is assigned to a specific faculty member who serves as the student's academic adviser. The assignment is normally made according to the student's declared major or according to a general academic interest indicated by the student. The student must declare a major by the end of the sophomore year and may also, with the permission of the appropriate dean, switch advisers if personal or academic needs warrant such a change.

Quarterly academic advising is required of all freshmen, sophomores, and juniors. Procedures for setting these meetings may vary among schools or colleges. Students should check with their assigned adviser or the dean's office for more complete information.

Pre-Medical Academic Advising

Admission to medical school is dependent neither on any particular undergraduate concentration, nor is it guaranteed by graduation from Santa Clara. Programs that satisfy the requirements prescribed by the Council of Education

of the American Medical Association are offered by several departments. Although the curriculum may be arranged in such a way that the student may comply with the requirements for entrance to medical schools in three years, medical schools generally prefer that students spend four years in preparation and include such cultural courses in their programs as will better fit them for the practice of medicine. The pre-medical advisers, in conjunction with the students' own academic advisers, will assist them in preparing their programs in the major of their choice. Prospective applicants for admission to medical schools are urged to study the *Medical School Admission Requirements of U.S.A. and Canada,* which is published each year and is available from the Association of American Medical Colleges, One DuPont Circle N.W., Washington, D.C. 20036.

Pre-Dental Academic Advising

Pre-dental programs meeting all the requirements for entrance into dental schools are offered by several departments. The pre-dental advisers, in conjunction with the students' own academic advisers, will assist them in preparing their own programs in the major of their choice. *Admission Requirements of U.S. and Canadian Dental Schools* is published each year and is available from the American Association of Dental Schools, 1625 Massachusetts Ave. N.W., Washington, D.C. 20036.

Pre-MBA Academic Advising

The College of Arts and Sciences offers a pre-MBA program for any of its departmental majors. In addition to the departmental major requirements, the pre-MBA student should take the following courses as college requirements or as electives:

1. Economics 1 and 2 (Principles of Economics I, II)
2. Mathematics 11 (Calculus and Analytic Geometry I)
3. Two of the following:
   a. Mathematics 12 (Calculus and Analytic Geometry II)
   b. An introductory computer course (offered in Math, Business, and Engineering)
   c. Management 11 (Business and Society)
   d. Accounting 1 and 2 (Fundamentals of Accounting I, II)

Pre-Law Academic Advising

There is no particular major or pre-law program required to qualify for law school. Admissions officers in the best law schools recommend undergraduate preparation in a major that requires discipline, clarity of thought, and precision in written and oral work. In addition to the College and major requirements, elective courses in English, history, speech, the social sciences, and the fundamentals of accounting provide valuable training for students intending to pursue a career in law. Early in their undergraduate careers, these students

should consult their advisers, or one of the specially designated pre-law advisers, to formulate a program designed for their specific needs and career goals.

Pre-Teaching Academic Advising

The academic major for undergraduates interested in pursuing a career in elementary school teaching is Multidisciplinary Studies with an emphasis in Pre-Teaching, a program approved by the California Commission on Teacher Credentialing. This program encompasses four broad areas: (1) English and communication; (2) mathematics and physical/life sciences; (3) social sciences; and (4) humanities and fine arts. Students who would like to teach at the elementary level and do not complete this major must take the state subject matter examination. Contact the coordinator of the Multidisciplinary Studies/Pre-Teaching program for further information.

Students interested in becoming secondary school teachers must take either the state examination in the subject they intend to teach or complete an approved program that waives the examination. Approved waiver programs at Santa Clara are in the following areas: mathematics, biology, physics, English, history, chemistry, combined sciences, Spanish, French, and German. Students should contact the department adviser in these subject areas for information on these single-subject waiver programs.

Students may also wish to consult the director of the Teacher Education program for advice on careers in teaching. Refer to the Division of Counseling Psychology and Education section of this bulletin for further information on teacher education at Santa Clara.

STUDENT RECORDS

University policy relating to student records complies with the Family Educational Rights and Privacy Act of 1974 (Buckley Amendment). Accordingly, the University may release "directory information" to any person on request, unless a student requests in writing that directory information be held private. Directory information is designated as

1. Student's name
2. Sex
3. Address (campus, local and/or permanent)
4. Telephone number
5. Date and place of birth
6. Major field of study, classification, dates of attendance, degrees, and honors received
7. Most recent previous educational institution attended
8. Past and present participation in officially recognized activities including intercollegiate athletics
9. Name, weight, and height of participants on intercollegiate athletic teams

During the registration period and throughout the academic year students may request in writing, through the Student Records Office, that directory

information be held private. Once filed, the request remains in effect only for the remainder of that academic year.

Certain types of records are excluded by law from inspection, specifically those created or maintained by a physician, psychiatrist, or psychologist in connection with the treatment or counseling of a student. Parents' financial information, including statements submitted in connection with scholarship applications, is also excluded by law from inspection. Third parties shall not have access to education records or other information pertaining to students without the written consent of the particular student about whom the information is sought.

Students may inspect their records at the following offices:

1. Official academic records, including application forms, admission transcripts, letters of acceptance, and a student's permanent academic record are on file and maintained in the Student Records Office.
2. Working academic files are also maintained by the deans in their respective offices.
3. Records related to a student's nonacademic activities are maintained in the Office of the Vice President for Student Services.
4. Records relating to a student's financial status with the University are maintained in the various Student Financial Services offices.

Complaints regarding academic records by students may be directed to the dean of the College or School in which the student is enrolled, to the director of Student Records and Financial Services, or to the registrar. Students having questions regarding the policy on the privacy of records should contact the Student Records Office (Walsh Administration Building).

HONOR SOCIETIES

Santa Clara University is proud to host eleven prestigious national honor societies in the liberal arts, business administration, electrical engineering, history, mathematics, physics, and technical studies. These societies reflect a long tradition of academic excellence, tracing their origins back at least 50 years. Some date from the nineteenth century and one dates from the eighteenth.

Alpha Sigma Nu

Alpha Sigma Nu, the national Jesuit honor society, was founded at Marquette University in 1915. The Santa Clara chapter was installed in 1942, and there are chapters at 28 universities and colleges across the country. Alpha Sigma Nu upholds the Jesuit values of academic excellence and service to the University and the community. Each year new members are selected for their commitment to excellence in scholarship and service.

Beta Gamma Sigma

Beta Gamma Sigma is the national honor society for students of business. It holds a position analogous to that of Phi Beta Kappa in the arts and Sigma Xi in the sciences. Election to membership is the highest scholastic honor that a student of business can achieve and is limited to outstanding men and women students who give promise of success in the field of business and who rank in the upper 5 percent of the junior class and the upper 10 percent of the senior class.

Eta Kappa Nu

Eta Kappa Nu, the electrical engineering honor society, was founded in 1904 at the University of Illinois. The Santa Clara chapter was established in 1971. There are now 135 college chapters, 9 alumni chapters, and over 130,000 members. The society recognizes academic excellence in engineering and promotes the spirit of liberal culture among its members. To be eligible for membership, students must rank among the top third of their graduating class in engineering.

Phi Alpha Theta

Phi Alpha Theta, the international honor society in history, was founded in 1921 at the University of Arkansas. There are now over 475 chapters in 49 states, Puerto Rico, Canada, and the Philippines. The Lamda Upsilon chapter, established at Santa Clara University in 1966, has been active in student and educational programs. Members are selected on the basis of excellence in the study and writing of history.

Phi Beta Kappa

Phi Beta Kappa, the oldest national honor society, was founded in 1776 in Williamsburg, Virginia, by students at the College of William and Mary. Then, as now, the society's purpose was to celebrate excellence in all scholarly endeavors and to encourage educational breadth, including languages, mathematics, the sciences, and the humanities. There are now over 230 chapters at universities throughout the country. The Pi chapter at Santa Clara University was installed in 1977. Installation of a chapter indicates that the United Chapters of Phi Beta Kappa have found a university's curricula sufficient in breadth and scholarly quality to warrant being honored by the society. Students are selected for membership on the basis of academic excellence, intensive study in a second language and college mathematics, and breadth of course work.

Phi Sigma Iota

Phi Sigma Iota, the national foreign-language honor society, was founded in 1922 at Allegheny College. Beta Delta chapter was installed at Santa Clara University in 1982. The society recognizes remarkable ability and achievement in languages, literatures, and linguistics. It stimulates advanced work in these fields, fosters intercultural understanding, and promotes a spirit of amity

between our own people and other peoples of the world. Junior and seniors with at least four advanced content courses completed in a qualifying language, a grade point average of 3.25 in that language, and a cumulative average of 3.0 may be eligible for membership.

Phi Sigma Tau

Phi Sigma Tau was founded at Muhlenberg College in 1930 as Alpha Kappa Alpha. In 1955, it was incorporated as Phi Sigma Tau, a national honor society in philosophy. Its essential purpose is to promote ties between philosophy departments in accredited institutions and students in philosophy nationally. Santa Clara University received its charter in 1986. To be eligible for membership, students must have completed five quarters of college work, rank in the upper one-third of their class, and have completed at least three courses in philosophy with an average grade of 3.0 or better.

Pi Mu Epsilon

Pi Mu Epsilon, the national honor society in mathematics, was incorporated in 1914 at Syracuse University. The California Eta chapter was founded in 1967 at Santa Clara University. Pi Mu Epsilon works to promote scholarly activity among college students. Membership requirements include an overall grade point average of 3.0 and the completion of two years of college mathematics, including calculus, with a B average.

Sigma Pi Sigma

Sigma Pi Sigma, the national physics honor society, was founded in 1921 at Davidson College, North Carolina. The society currently has more than 275 chapters and 40,000 members. The Santa Clara chapter was founded in 1969. Sigma Pi Sigma encourages a greater understanding and interest in the advanced study of physics, promotes research, and fosters the spirit of scientific inquiry. Members are selected from the upper quarter of their class and must also have a 3.2 grade point average in physics and mathematics.

Sigma Tau Delta

Sigma Tau Delta, the national English honor society, was founded in 1924 at Dakota Wesleyan University. The Santa Clara chapter, Phi Phi, was established in 1987. Sigma Tau Delta recognizes scholarly achievement in English language and literature in all its aspects, including creative and critical writing. Members must be in the upper 35 percent of their class and must also have a B average in English.

Sigma Xi

Sigma Xi was founded in 1886 by a group of scientists at Cornell University. The Santa Clara chapter was established in 1967. The purpose of this society is to encourage original investigation in science, both pure and applied. Students

who have demonstrated an aptitude for original scientific research are eligible for associate membership. The requirements for full membership include noteworthy achievements in research as demonstrated by a doctoral dissertation, publications, or patents.

Tau Beta Pi

Tau Beta Pi, a national honor society for technical students, was founded in 1885 at Lehigh University. There are now more than 144 chapters with a total membership of over 175,000. The Santa Clara chapter was established in 1956. This organization recognizes superior scholarship and exemplary character. Members are selected from the upper fifth of the graduating class in engineering and must demonstrate personal integrity, breadth, adaptability, and unselfish activity.

Theta Alpha Kappa

Theta Alpha Kappa is the national theology and religious studies honor society. The society, founded in 1976 at Manhattan College, is for both professors and students. The Santa Clara chapter, Alpha Phi, was granted a charter in 1981. Its main purpose is to further the study of theology and religious studies by fostering excellence in these studies. Religious Studies majors and minors with a grade point average of 3.5 and a cumulative index of 3.0 will be eligible for admission to the society.

SCHOLARSHIPS

The University awards annual scholarships to students on the basis of financial need and academic promise or special talents. For more information, refer to the Financial Services section of this bulletin and to the information bulletin published by Student Records and Financial Services.

UNIVERSITY AWARDS

Valedictorian Established by the University in 1980, this honor is conferred annually on a graduating senior selected for outstanding academic achievement and University service as determined by the academic vice president and the faculty of the University.

The Nobili Medal Established in 1876 by Joseph A. Donohoe, in honor of Fr. John Nobili, S.J., founder of the University, this award is given to the male graduate judged outstanding in academic performance, personal character, school activities, and constructive contribution to the University by the faculty and the academic vice president.

The Saint Clare Medal Established by the University in 1968 in honor of Saint Clare of Assisi, this award is given to the female graduate judged outstanding in

academic performance, personal character, school activities, and constructive contribution to the University by the faculty and the academic vice president.

SPECIAL AWARDS

Community Service

The Richard J. Riordan Awards Established in 1984 by Richard J. Riordan, these awards are given annually to four students judged outstanding in community service.

Forensics

The Ryland-Owl Prize Established in 1897 by the Honorable Caius T. Ryland, this award is given to the winner of the annual Ryland debate. Focusing on current social and political issues, this public debate is held every spring and judged by a faculty committee.

Journalism

The Handlery Prize Founded in 1947 by Mrs. Rose Handlery in memory of her son Raymond of the class of 1934, this prize is awarded each year by the Publications Committee to the graduating senior who has contributed most to the success of student publications at the University.

AWARDS IN THE LEAVEY SCHOOL OF BUSINESS AND ADMINISTRATION

The Business Administration Prize Founded in 1942, this prize is given annually by the Business Administration Association to the student who has made the greatest contribution to the Leavey School of Business and Administration.

The Isabel Jones Prize Founded by Dr. Eliot Jones in 1956 in memory of his wife, Isabel, this award is given to the senior in the Leavey School of Business and Administration judged most outstanding in scholarship by the business school faculty.

The Charles J. Dirksen Prize Founded in 1965 by Dr. Eliot Jones in honor of Charles J. Dirksen, dean emeritus of the business school, this prize is awarded to the junior in the Leavey School of Business and Administration judged outstanding in scholarship by the faculty.

The Professor O. Robert Anderson Award Established in 1973, this award is given in memory of Professor O. Robert Anderson who taught accounting at the University. It is awarded annually to the accounting major judged outstanding in scholarship by the faculty of the department.

The Albert F. Bruno Award Established in 1982 in memory of Albert F. Bruno by Albert V. Bruno and family, this award is conferred annually to the outstanding marketing major on demonstration of scholarship, leadership, personal character, and career potential.

The Financial Executives Award Established at Santa Clara in 1980, this award is given annually by the Financial Executives Institute to the senior, junior, and sophomore finance majors judged outstanding in scholarship and executive potential by the finance faculty and members of the institute.

The Outstanding Accounting Student Award Established in 1973, this award is given annually by the San Jose Chapter of the California Society of Certified Public Accountants to the senior accounting major judged outstanding in scholarship and professional career potential by a committee of the chapter.

The Wall Street Journal Student Achievement Award Established at the University by the Dow Jones Corporation in 1960, this award is given to the senior finance major with the highest scholastic average.

AWARDS IN THE SCHOOL OF ENGINEERING

The Edmund C. Flynn Memorial Awards Established in 1981 by Mrs. Edmund C. Flynn in memory of her husband, these awards are given to the graduating civil engineering student presenting the best thesis and to the two junior civil engineering students with the highest scholastic averages.

The Regan Memorial Award Founded in 1977 in memory of Patrick W. Regan of the class of 1947, this award is given to the outstanding juniors in civil engineering as determined by the faculty of the department.

AWARDS IN THE COLLEGE OF ARTS AND SCIENCES

Chemistry

The Professor Joseph F. Deck Award Established in 1973, this award is given by the Chemistry faculty to the outstanding student majoring in chemistry who has excelled in studies and undergraduate research, extracurricular activities, leadership, and generous tutoring of fellow students, while maintaining a B average.

Communication

The Communication Department Prize Established in 1985 by alumni and friends, this award is given by the Communication Department faculty to the graduating senior who best meets the goals of the department.

English

The McCann Short Story Prize Founded in 1894 in honor of Daniel M. McCann, B.S. 1884, this award is given by the English Department to the author of the best short story as determined by an annual competition.

The Shipsey Poetry Prize Founded in 1954 by Richard W. Schmidt in honor of the late Reverend Edward Shipsey, S.J., this prize recognizes the outstanding contribution in the art of poetry as determined by an annual competition.

German

The Ruth Butzen German Friendship Prize Established in 1981 by W. E. and Elaine Sharp, this award is given to the intermediate student who writes the best essay in German in an annual contest.

The Anna Hasselbach Rau Prize Established in 1981 by Barbara R. Sullivan, this award is given to the advanced student submitting the best essay in German in an annual competition.

History

The Redwood Prize An annual prize established in 1908 by the executive committee of the *The Redwood,* this award is given to the student who writes the best essay on a historical subject as determined by the faculty of the History Department.

Italian

The San Jose Civic Club Prize Founded in 1956, this award is given by the Italian Department to the student most diligent in the study of Italian.

Language

The Richard F. Rebello Phi Sigma Iota Award Established in 1986 by the family of the late Mr. Richard Rebello, longtime staff member at the University, these awards are given by the Modern Languages Department to junior or senior language majors for outstanding accomplishments in the study of a foreign language and culture.

Mathematics

The Freshman Mathematics Prize Established in 1958, this annual award of books is given by the faculty of the Mathematics Department to the freshman student who demonstrates excellence in mathematical study and achievement, determined by a competitive examination each spring.

The George W. Evans Memorial Prizes Founded in 1972 by the family and friends of the late Dr. George W. Evans II, professor of mathematics at the University, these awards are given to the male and female students placing

highest in the William Lowell Putnam Mathematical Competition. A third award is given to the student judged most outstanding in mathematical writing and research by a panel of mathematics consultants.

Music

American Choral Directors Association National Choral Student Award This award is given to a student who has been involved in continued participation in choral ensembles, has provided service to the ensemble and conductor, has demonstrated a high degree of choral proficiency and music literacy, and has contributed to the advancement of choral singing at the University.

Department of Music Certificate for Distinguished Musical Performance Established in 1980. The faculty of the Music Department may award a performer's certificate to a student demonstrating exceptional accomplishment in music, excellence in musicality, and technical proficiency.

Natural Science

The Orella Prize Established in 1915 by Dr. Firim R. Orella, B.S. 1889, and funded in 1945 by his wife, Albertine S. Orella, this prize is awarded to the senior science student who attains the highest average in scientific subjects.

Philosophy

The Class of 1939 Award in Philosophy Established in 1983 by the Class of 1939, this award is given by the Philosophy faculty to the junior student who has achieved academic excellence in the study of philosophy in the Jesuit tradition.

The Sourisseau Prize Founded in 1956 by Miss Eva Sourisseau in honor of her parents and family, this award is given by the Philosophy faculty to the student demonstrating outstanding achievement in the study of philosophy.

Physics

The IBM Corporation Prize Established in 1979 by IBM, this prize is awarded to the most outstanding student in Physics 4, 5, and 6 (Physics for Scientists and Engineers I, II, and III) as selected by the faculty who teach the sequence.

Political Science

The Michael Shallo Prize Founded by the University in 1955 in honor of Fr. Michael Shallo, S.J., this award is given by the Political Science faculty to the student judged most proficient in political science.

Psychology

The Wilhelm Wundt Award Established in 1988, this annual award is given by the faculty of the Psychology Department to the senior student who has excelled in scholarship, research, and service to the department.

Religious Studies

The Religious Studies Prize Established in 1950 by the president of the University, this prize is given each year by the Religious Studies faculty to the student most proficient in religious studies.

Sociology and Anthropology

The Witold Krassowski Sociology/Anthropology Awards Established in 1979 by the department, alumni, and friends in honor of Professor Witold Krassowski, the first sociologist at Santa Clara, these prizes are awarded by the faculty to the students in the department demonstrating exemplary research in sociology and anthropology.

Theatre and Dance

The William H. Leahy Prize Founded in 1925 in honor of William H. Leahy by his wife and his brother James, this prize is awarded to the graduating senior who has made the greatest contribution to dramatic art at Santa Clara as determined by the members of the Theatre and Dance Department.

ROTC

Armed Forces Communications and Electronics Award Established by the Department of the Army at Santa Clara in 1973, this annual award is given by the Military Science faculty to the cadet in a communications or electronics field who excels in academic achievement, demonstrated leadership potential, and meritorious contribution to the ROTC program.

Association of the U.S. Army ROTC Medal Established at Santa Clara in 1956 by the Department of the Army, this award is given by the Military Science faculty to the junior cadet judged most outstanding in meritorious academic attainment, exemplary conduct, efficiency, and fidelity.

The George C. Marshall ROTC Award Established at Santa Clara in 1977 by the Department of the Army, this award is given by the Military Science faculty to the cadet judged most outstanding in military studies and leadership.

The Medals of Santa Barbara Established by the University in 1953, these four gold medals are awarded annually by the president of the University to the outstanding cadet in each of the four years of military training for meritorious academic achievement, exemplary conduct, efficiency, and fidelity, as determined by the Military Science faculty.

The Superior Cadet Award Established by the Department of the Army at Santa Clara in 1958, these ribbons are given by the Military Science faculty to the cadet in each of the four years of training who consistently demonstrates potential qualities of an officer, outstanding performance of duty, and overall proficiency.

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Academic Regulations

GRADING SYSTEM

Grades reflecting the quality of a student's work are reported as follows: A (excellent), B (good), C (adequate), D (barely passing), F (not passing), P (pass), NP (not pass), and I (incomplete).

The grades A, B, C, and D may be modified by (+) or (-) suffixes, except that the grade of A may not be modified by a (+) suffix. Grade point values per unit are assigned as follows: A = 4.0; A- = 3.7; B+ = 3.3; B = 3.0; B- = 2.7; C+ = 2.3; C =2.0; C- = 1.7; D+ = 1.3; D = 1.0; D- = 0.7; and F, I (incomplete), P (pass), NP (not pass), AUD (audit), NR (no grade reported by instructor—this notation is assigned by the Student Records Office)—and W (withdrawn) = 0. Unit credit, but not grade point credit, is awarded when the grade of P is assigned.

Students must achieve a grade point average of 2.0 in their declared major(s) and academic minor, as well as a cumulative grade point average of 2.0 or better in all courses in order to be eligible for graduation. A grade point average is determined by multiplying each grade point value by the number of quarter units assigned to the course, adding these grade point units from all courses taken, and dividing this sum by the total number of quarter units for which letter grades were reported.

Student grade reports, issued at the end of each quarter, indicate the grade point average earned during the quarter just completed as well as the cumulative grade point average the student has earned to this point.

Pass/Not Pass Option

A junior or senior may choose to take an elective course on a pass/not pass (P/NP) basis. (An elective course is one other than a University, College, or department requirement.) The pass/not pass choice can be made up to the final day of adding classes.

A grade of P signifies that the quality of work done is equivalent to a letter grade of C or better, while a grade of NP denotes work at the level of C-, D, or F. Courses taken under the pass/not pass option will fulfill graduation requirements but are not used in determining grade point averages.

Students may elect only one course per quarter on a pass/not pass basis. A maximum of six such courses can be applied to graduation requirements.

Incompletes

A student may receive an Incomplete grade (I) in a course if, because of extraordinary circumstances beyond the student's control, some essential portion of the assigned work has not been completed before the final examination. The unfinished work must be completed and given to the course instructor within three weeks of the beginning of classes in the next scheduled term (not the student's next term of enrollment), excluding summer session, unless extraordinary circumstances require an extension of time. All extensions of time must be in writing and approved by the dean; they should not exceed a period of time longer than two academic quarters after the Incomplete was earned, excluding summer session. Approval for an extension of time must be obtained and forwarded to the Student Records Office within the three-week period mentioned above.

Change of Grade

Only the instructor in charge of a course may assign grades. All grades, except incompletes, become final when they have been assigned and reported to the Student Records Office. An instructor may approve and report to the Student Records Office a correction of a final grade only if a clerical or procedural error was made in assigning, transmitting, or recording the original grade.

Unit Overload Restrictions

The academic study program of students enrolled in the Leavey School of Business and Administration or the College of Arts and Sciences may not exceed 18 units per term unless they have earned a cumulative grade point average at Santa Clara of at least 3.3 or have written permission from their academic dean to exceed that number. Students in the School of Engineering are restricted to a maximum of four courses each term unless the same conditions are met. Exceptions will be made for those students who are auditing a course.

Note: Students who register for more than 18 units without having received prior written approval of their dean will not receive credit for the additional course or courses taken.

COURSE RESTRICTIONS

Lower-division students may not enroll in upper-division courses without the written approval of their dean. Failure to obtain this written approval may result in loss of academic credit for the upper-division course or courses taken.

CHALLENGING COURSES

Students may challenge certain courses to satisfy specific subject requirements for graduation. However, units earned in this manner may neither be

counted toward the total needed for graduation, nor can they be used to satisfy the residency requirements.

To challenge a course, the student takes a special three- to four-hour examination on the material covered by that course and any additional requirements. All courses listed in the *Undergraduate Bulletin* may be challenged except those involving laboratory, studio, or specialized group work and those whose descriptions in the catalog are followed by the letters NCX.

In order to be eligible to challenge a course, students must (1) have completed at least one term at Santa Clara; (2) have a cumulative grade point average of at least 2.2 and a grade point average of 2.5 or better in their major; and (3) have received the permission of the instructor of the course and academic dean of the School or College as indicated on the petition form available from the Student Records Office.

Challenge examinations are arranged by the instructor. The petition form must be submitted to the Student Records Office at least two weeks prior to the examination. A fee of $50.00 is charged for each course challenged.

Challenged courses may not be graded P/NP, and no more than one course may be challenged each term.

REPETITION OF COURSES

With the written approval of the academic dean of their School or College, students may repeat a course in which they receive a grade of D or lower in the first attempt. All courses, whether repeated or not, are included in the calculation of grade point averages. However, units needed for graduation will be awarded only once for each course passed.

A few courses are designated as repeatable, and students will receive a grade and units toward graduation for each successful completion.

AUDITING COURSES

Students may audit one course in addition to their regular study load. Permission to audit a course will be given only on the last day to add classes, and then only if space is available in the class. Although no credit is assigned for an audited course, the audit can be used as preparation for a challenge of that course during the following term. The successful completion of an audit will be indicated on a student's transcript by the notation AUD. For those students not enrolled full time, a course audit fee is charged for each course audited.

INDEPENDENT STUDY

Under certain conditions, upper-division students may pursue independent study through Directed Reading, Directed Research, Practica, or Internships. To qualify, a student must have demonstrated a sufficient knowledge of the academic discipline involved to make independent study both possible and

beneficial. No more than four independent study courses can be used to satisfy graduation requirements and no more than one independent study course may be taken per term. Certain practica and internships are not subject to the one course per term requirement.

Students wishing to enroll in independent study courses must submit the Petition for Independent Study form, together with the required materials and approvals, to their academic dean at least one week prior to the date of registration. The forms are available from the offices of the academic deans and the Student Records Office.

CHANGE IN REGISTRATION

During the first week of each term, students are permitted to alter their original registration schedule by following the regular procedures established for this purpose by the Student Records Office. During the second, third, and fourth weeks of classes, a student may withdraw from a class without a "W" notation appearing on the academic record. During the fifth, sixth, seventh, and eighth weeks of classes, a student is permitted to withdraw from a class, but a "W" notation will appear on the academic record. After the end of the eighth week of classes and up to one week before the final examination, a student may withdraw from a class only with written permission of the dean. No withdrawal is permitted during the final week of classes. The form required to effect a formal withdrawal from a class is available from the Student Records Office. Failure to file this form may result in the student's receiving a grade of F in the class.

TRANSFER WITHIN THE UNIVERSITY

Students wishing to transfer from one School or College to another within the University must file a petition for admission with the dean of the School or College they wish to enter. The action taken as a result of the petition will depend on the applicant's past academic record and on the availability of space within that School or College. No student whose grade point average is less than 2.0 will be considered for transfer.

CONCURRENT ENROLLMENT

Permission for concurrent enrollment at another academic institution will be granted by the academic dean only for extraordinary reasons.

ATTENDANCE

Students are required to attend all classes. Penalties for absences are left to the discretion of individual instructors. Students are held accountable for all

assignments in each course, whether or not the assignments were announced during an absence.

WRITTEN EXAMINATIONS

Written examinations are usually given at the middle and end of each term. Grade reports are issued only at the end of the term. Midterm letter grades in all courses are calculated and made available by the instructor to all freshmen as well as to those sophomores, juniors, and seniors whose work is deficient.

ACADEMIC INTEGRITY

The University is committed to academic excellence and integrity. Students are expected to do their own work and to cite any sources that they use. A student who is guilty of dishonest acts in an examination, paper, or other required work for a course, or who assists others in such acts, may receive a grade of F for the course. In addition, a student guilty of dishonest acts may be immediately dismissed from the University.

A student who violates copyright laws, including those covering the copying of software programs, or who knowingly alters official academic records from this or any other institution is subject to similar disciplinary action.

ACADEMIC STANDING

To be in good academic standing, a student must maintain a cumulative grade point average equal to or greater than 2.0 based on all courses taken at Santa Clara and must have completed in excess of a minimum number of units, as specified below. Failure to meet these conditions may result in academic probation or disqualification from future registration at the University.

Academic Probation

Students who have completed at least three quarters of academic work at Santa Clara or elsewhere are subject to being placed on academic probation if their cumulative grade point average is less than 2.0 based on all courses taken at Santa Clara.

Students who have not yet completed three quarters of academic work at Santa Clara or elsewhere normally are not subject to academic probation as long as their cumulative grade point average is at least 1.6 based on all courses taken at Santa Clara.

Full-time students may also be subject to academic probation if they fail to make progress toward their degree at a reasonable rate; thus they are subject to academic probation if

1. They have not completed at least 36, 76, 115, or 160 quarter units by the end of their third, sixth, ninth, or twelfth quarters of residency, respectively; or
2. They have completed fewer than 36 quarter units in the past three quarters of residency.

Academic Disqualification

Students are subject to disqualification from further registration at the University if

1. They remain on probation for more than two consecutive quarters; or
2. Their cumulative grade point average falls below 1.6; or
3. They complete fewer than 30, 64, 100, or 150 quarter units by the end of their third, sixth, ninth, or twelfth quarters of residency, respectively.

Reinstatement

Reinstatement after disqualification from the University is rarely permitted, and then only on the recommendation of the dean of the School or College in which the student was enrolled. It also requires favorable action by the Committee on Admissions.

Requests for reinstatement should be addressed to the Admissions Office and must include a description of any activities engaged in during the period of disqualification that would indicate that an improved academic performance can be excepted in the future.

Note: Ordinarily a student may not apply for reinstatement within a year of the date of disqualification. The application will be considered only if the student's academic deficiencies can be removed within a reasonable period of time.

Withdrawal from the University

Students who wish to withdraw from the University during a quarter must complete a withdrawal form and an exit interview at the Student Resource Center. If the formal requirements for withdrawal are met, the student's registration will be canceled without academic penalty. A withdrawal notation (W) will be assigned for each course from which the student withdraws after the fourth week of the quarter. Students who leave the University during a quarter without formally withdrawing are subject to failing grades in all courses in which they were registered. Such students are ineligible for refund of fees.

Any student leaving the University at the conclusion of any quarter also should complete the standard withdrawal process.

No withdrawal, either during or at the end of a quarter, will be considered complete unless the student has met all the financial obligations at the University. Students attending the University on deferred payment plans or with student loans must also clear their financial obligations with the Credit and Collection Office. Students who have unpaid University bills will not receive academic transcripts until their account has been settled.

Returning to the University

Students who leave the University may return without filing a formal application for readmission if they meet all of the following conditions:

1. They left the University in good standing;
2. They plan to return to the same school or college of the University;
3. They are returning within a five-year period; and
4. They notify the Student Records Office in writing at least 30 days prior to the date of their return registration.

Re-enrolling students who have attended another college or university are required to forward to the Student Records Office an official transcript of all work completed during their absence. Re-enrolling students will be subject to the curriculum requirements contained in the *Undergraduate Bulletin* in effect at the time of re-entry.

Student Retention

For the latest academic year, 3 percent of the full-time undergraduate students who enrolled for the fall quarter did not maintain their enrollment for the full academic year.

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University Religious, Social, and Cultural Life

CAMPUS MINISTRY

Campus Ministry functions as a leaven within the University community so that the Living God may be magnified in all people: students, staff, faculty, and alumni. In keeping with the Jesuit tradition of developing the person, and with the ideal that all of us be people for others, Campus Ministry seeks to facilitate growth in individuals and the community by its presence, programs, and services.

The Campus Ministry staff reflects the reality of the Church today: a team of men and women — lay, religious, and clergy — who encourage all members of this community to deepen their religious commitment in "the service of faith, of which the promotion of justice is an absolute requirement" (Decree 4, 32nd General Congregation of the Society of Jesus).

To attain this vision, Campus Ministry offers the University community a variety of programs: liturgies and other sacramental celebrations, retreats, counseling and spiritual direction, educational forums, interfaith sharing, and Bible studies. We collaborate with all segments of the community in the planning and carrying-out of our programs.

In all of this, Campus Ministry is guided by the words of the prophet Micah: "This is what the Lord asks of you, only this: to act justly, to love tenderly, and to walk humbly with your God."

STUDENT LIFE

Participation in extracurricular activities is encouraged as part of the total development of the Santa Clara student. The primary educational objective in supporting student activities and organizations is to foster a community that is enriched by men and women of diverse backgrounds and wherein freedom of inquiry and expression enjoy the highest priority.

The following sections describe various aspects of student life and services. More detailed information is provided in the *Student Handbook,* which may be obtained by writing to the Office of the Dean of Students.

Student Conduct

Through its Statement of Student Responsibilities and Standards on Conduct, the University attempts to foster and preserve a community where respect for people and property is paramount. All students are encouraged to pay special attention to the effect of their actions on others.

The president of Santa Clara University has delegated to the vice president for Student Services general supervision for matters of student conduct. Specific responsibility and authority for the University judicial system has been assigned to the dean of students. Student disciplinary cases are heard by the appropriate judicial board council or by a judicial hearing officer. The dean of students or his/her designee determines which course of action is taken based on the nature of the case and the guidelines for judicial boards/councils found in the University *Judicial System Handbook.*

The structure of the University judicial system consists of

- Residence Life Judicial Councils, which are living-group councils composed of students with jurisdiction over cases arising in or around residence halls or apartments;
- the Student Life Judicial Council composed of students with jurisdiction over cases arising on or about the campus other than residence halls or apartments and at University-sponsored events in off-campus locations;
- the University Discipline Council composed of students and faculty/staff, which hears all cases of a serious nature and any case that may result in separation from the University;
- the University Board of Appeals composed of students and faculty/staff, which hears appeals from the University Discipline Council.

Final appeals from all judicial bodies or hearing officers are made to the vice president for Student Services acting on behalf of the president. In exceptional circumstances, the vice president for Student Services may suspend the normal structure of the University judicial system and appoint judicial hearing officers to conduct disciplinary hearings.

Student Housing and Residence Life

The University maintains 11 residence halls and two apartment complexes accommodating about 2,000 students. Each residence hall room is furnished with standard twin beds, desks, chairs, chests, and bookshelves. Residence halls have common bath facilities, and some student rooms have sinks. Most residence hall rooms are planned for double occupancy. The apartment complexes include one-and two-bedroom units furnished appropriately to the size and style of the apartment. Although most of the residence halls are coeducational by floor or wing, buildings are available for those students who prefer single-sex arrangements. Men and women students share lounge areas, study rooms, television and recreation rooms, kitchens, coin-operated laundry facilities, and other common services.

Both professional and student staff live in campus housing and are committed to providing an atmosphere conducive to effective community living. The goal of the staff is to provide a living-learning environment that encourages academic achievement while assisting each individual student and the resident community in their development.

Students who wish to apply for accommodations in University housing should submit an application and contract with the required housing reservation deposit to the Office of Housing and Residence Life. Freshmen submitting the required contract and reservation deposit by the designated deadline are guaranteed accommodations in University housing. If a housing reservation is cancelled, the deposit will be forfeited in accordance with the refund schedule. Upperclassmen are assigned University housing in accordance with the housing room selection and assignment process.

Requests for applications and other correspondence regarding student housing should be addressed to the Office of Housing and Residence Life.

Athletics

The University maintains a well-balanced program of intercollegiate, instructional, and intramural athletics.

Intercollegiate competition for men is conducted in football, basketball, baseball, tennis, water polo, golf, soccer, crew, bowling, cross-country, volleyball, lacrosse, and rugby. Intercollegiate competition for women is conducted in volleyball, basketball, softball, tennis, cross-country, soccer, and crew. All of the participants in these sports compete against opponents of recognized national standing.

The University is a member of the National Collegiate Athletic Association, West Coast Athletic Conference, Western Football Conference, and Pacific Soccer Conference.

STUDENT ACTIVITIES

The Student Activities Office in Benson Memorial Center is available to assist students in maximizing their educational opportunities outside the classroom and to promote the value of community service for all student organizations. The office staff function as advisers to Associated Students, including the Executive Board, Student Senate, Board of Constitutional Review, and Social Presentations. They also advise the Benson Center Program Board, Santa Clara Community Action Program, and Special Olympics Committees.

This office also administers the University recognition procedure for all student clubs and organizations. Students interested in joining a student organization or forming a new club or organization are encouraged to come by the Student Activities Office for more information.

A number of leadership workshops for student organization leaders are offered throughout the year. Workshops cover such topics as membership recruitment and retention, planning effective meetings, leadership transition, publicity, fund raising, program planning, organizational finances, and program evaluation.

Students who desire to participate in a leadership workshop or need advice on any matter relating to a student organization should contact the staff in the Student Activities Office for assistance.

Student Government

The system of student government at Santa Clara is student regulated, student funded, and student elected.

Students organize academic, cultural, and social activities through class government, clubs, and committees. Through the Student Senate, students promote student activity at extracurricular events on campus. Residence Hall Councils are an adjunct of student government and share with the residence hall staff the responsibility for promoting academic, religious, and social programs among resident students.

Students also participate in University-wide governance through representation on the University Community Council and on University committees advisory to the president.

Associated Students ASSCU (Associated Students of Santa Clara University) is the official undergraduate voice of the student body. All fee-paying registered students are members, and elections are held during spring quarter.

The purposes of the ASSCU are to further the interests of the University and its students, to encourage student activities, and to provide valuable experience and training in self-government and responsibility.

Student Organizations

Students can become involved in a number of the more than 70 academic, recreational, religious, social, ethnic, and political organizations active on campus. Information on how to join or form an organization is available in the Student Activities Office.

Santa Clara Community Action Program The Santa Clara Community Action Program (SCCAP) is a student volunteer organization founded in 1966. The volunteer opportunities that it offers in schools, hospitals, special educational centers, and the local jail system provide experiences in education, law, medicine, psychology, religious studies, and sociology. This exposure is not only useful in making wise career decisions, but important in the sharing of moral values.

Debate Santa Clara has traditionally had one of the strongest intercollegiate debate teams in the western United States. The team participates in approximately ten tournaments annually, including several out-of-state invitationals.

The program is open to participation by all students, and some scholarships are available to those with previous experience in national contests. For information regarding these scholarships, contact the Financial Aid Office.

Honor Societies Santa Clara University honor societies are listed on pages 231–234 of this bulletin.

KSCU-FM Radio KSCU-FM is managed and operated by Santa Clara students. It is designed to train students in broadcasting skills and to provide the University community with music, news, sports, and public service information.

The Owl *The Owl,* founded in 1869, is the University's literary magazine and the oldest college publication in the West. It invites authors from every academic area to present their works for publication. Published three times a year, the magazine includes essays, journalistic pieces, short stories, poetry, and reviews.

The Redwood Having recently published its eighty-fourth edition, *The Redwood,* the University's student-produced yearbook, continues to record the annual story of the University. Over the years, *The Redwood* has earned a reputation for trendsetting and creativity in text, photography, layout, and graphic design.

The Santa Clara As the weekly campus newspaper, *The Santa Clara* reports on current events, sports, entertainment, and people. Outstanding coverage and design recently earned *The Santa Clara* an award that placed it in the top sixth of the country's university papers. All students, both undergraduate and graduate, are welcome to join the staff of nearly 75 students who work in reporting, photography, graphic design, typesetting, advertising, and layout.

STUDENT RESOURCES AND SERVICES

Listed below are the many service centers established to meet the needs of students. Each center provides a variety of programs to encourage personal growth.

Career Development and Placement Center

The Career Development and Placement Center provides a variety of services to assist students in clarifying, planning, and achieving their career goals.

A professional staff of counselors offers career counseling to individuals and groups. Workshops are held regularly on career planning, which includes self-assessment, resume writing, interviewing, and job search strategies. Programs have been developed that bring professionals from various fields to present information about career opportunities. A special program of informational interviewing links students with alumni in a variety of fields.

The Career Development and Placement Center maintains strong contacts with employers. Information on internships and cooperative education is available, as well as listings on full-time, part-time, summer, temporary, and work-study jobs. Over 250 local, national, and international employers recruit on campus to fill employment needs, and job career fairs attract many employers to the campus. An extensive file is maintained with names of contacts at employer organizations.

Counseling Services and Programs

Counseling Services and Programs, located on the second floor of Benson Memorial Center, offers free professional counseling to all undergraduate and graduate students. Confidential psychological counseling in a supportive atmosphere is designed to help students attain greater self-understanding and become more personally effective. Some of the concerns that students discuss with counselors include stress, depression, sexuality, individual identity, and family, friendship, and love relationships. The special issues of minority and international students are recognized. In addition to individual, couples, and family counseling, small groups and workshops related to topics of general interest are frequently offered. Consultation and referral for faculty and staff and training opportunities for graduate students in counseling are also available.

Students in crisis or with urgent needs can be seen immediately on a walk-in basis, and regular appointments through the receptionist can usually be made within one week by calling 554-4172. Counseling hours are Monday through Friday, 8:00 a.m. to 5:00 p.m. and evenings by appointment.

Student Health Center

Student health services are located in the Cowell Building on campus.

Students may see the campus physician by appointment or for emergency drop-in services 9:00 a.m. to noon and 2:00 p.m. to 5:00 p.m. weekdays while the University is in session. Nurses are available 24 hours per day every day. There are infirmary beds for those too ill for dormitory or apartment living but not sick enough to need hospitalization.

All full-time undergraduate students and full-time law students are eligible for medical care at the center at no charge as health service fees are part of their regular University fees. Graduate students and part-time undergraduate students, on payment of a minimal health service fee per quarter, are also eligible for medical care. With the exception of repayment for some drugs and laboratory work, no fee is charged to students using the service. Extra insurance coverage for outside care or other special needs is available and recommended for all students. Inquire at the Student Health Center for information or call 554-4501.

All full-time undergraduate and law students are required to have a preentrance health examination by their personal physician, as are graduate or part-time undergraduate students who choose Health Center service by paying the health service fee.

Student Resource Center

The Student Resource Center provides services to help specific student populations achieve a successful and satisfying experience at Santa Clara University. The center also strives to increase the cultural awareness of the University community. Additional services provided in the center include

interviews for students considering withdrawal from the University and coordination of the Multicultural Center. The following services are housed within the Student Resource Center:

Black Student Resources Black Student Resources addresses the many and varied needs of black students in a setting that furnishes the "identification ingredient" so necessary in initial contacts, and the office serves as a catalyst for continued understanding and cooperation. Students' academic and personal concerns are examined and explored for possible solutions, including appropriate referrals. BSR plans cultural programs and maintains a liaison with the local black community.

Chicano Student Resources Chicano Student Resources provides support and assistance to students who identify themselves as Chicanos or Latinos. Individual acadamic and personal adjustment concerns are addressed, and referral to other University services is facilitated when necessary. In addition CSR coordinates cultural, educational, and community involvement.

Disabled Student Resources Disabled Student Resources provides a centralized location where students with disabilities are helped to participate effectively in all aspects of campus life. The office assists students obtain instructional and living accommodations and access to University programs and activities. It also serves as a liaison between students and rehabilitation agencies and promotes awareness of disability issues in the campus community.

International Student Resources International Student Resources provides general advising and referrals, cultural programs, special events, speakers, and workshops for international students. Orientation, Host Family, and Cultural Sharing Partners are a few of the programs specifically designed to encourage relationships between American and international students. ISR also provides advice to the International Students Club, Overseas Chinese Students Club, and International Graduate Students Association.

Off-Campus Student Resources Off-Campus Student Resources encourages the commuter student to become more involved in the co-academic programs offered at SCU. The Off-Campus Students Association sponsors social activities targeted for nonresidential students. The office also facilitates interaction between on-campus and off-campus students and encourages more involvement and a sense of community for students not living on campus.

Women Student Resources Women Student Resources provides support, information, and programs that promote the personal, educational, and professional interests of women at Santa Clara. By encouraging University women to pursue their individual and collective goals, WSR reflects its commitment to challenge those aspects of society that diminish an individual's capacity to achieve full potential. WSR sponsors workshops and speakers on issues of concern to women and maintains a circulating resource library of books and current periodicals.

Multicultural Center The Multicultural Center, located in the lower level of Graham 100, provides an environment supportive of different heritages and experiences. Lounge space and resource materials are available for the University community. The center sponsors and hosts various cultural and ethnic programs and activities and maintains office space for minority student organizations, including Barkada, MECHA-El Frente, Igwebuike, Asian Pacific Student Union, Ka Mana 'O Hawaii, and Chinese Student Union.

Project 50 Project 50 is a special program that encourages local eighth graders from low-income families to complete high school and pursue a college education. Approximately 50 disadvantaged students, chosen on the basis of academic potential, need for motivational support, and low-income background, participate in this summer program each year. About 90 percent of those selected are members of ethnic minorities. Students in the project work for a spirit of personal values and self-assurance with the support of caring counselors. For Santa Clara students-turned-counselors, Project 50 provides an enriching experience.

Teaching and Learning Center

The Teaching and Learning Center, located in 247 Bannan Hall, offers a variety of programs to help students improve their learning skills and prepare for further education.

Two tutorial programs provide undergraduate students with assistance in many classes. In the Drop-In Tutorial Clinic, tutors are on duty on a regular schedule, and students may receive help in specific courses without making prior appointments. Through the Individual Tutorial Program, students may arrange for personal tutoring. Training in study skills, including coping with test anxiety, is available through workshops or individually. Academic Improvement Groups (AIGs) meet every term to improve general academic adjustment and to help students with time management, study reading, notetaking, and other study skills. Tests 'n Tension (TNT) groups help students prepare for and improve performance on different types of exams. For students who want to work on their own, there are self-paced instructional programs in comprehension, grammar, memory, spelling, notetaking, and other study skills.

The Teaching and Learning Center also assists juniors, seniors, and graduate students who plan to enter graduate or professional studies select a school and secure financial aid. It offers counseling, conducts workshops on writing statements of purpose, maintains a collection of directories and more than 800 catalogs, and arranges campus interviews with various graduate school representatives from California schools as well as those from other states.

For national and international competitions for scholarships in which candidates must be officially nominated or endorsed by the University, the director of the Teaching and Learning Center, together with several members of the faculty, selects the nominees and arranges the endorsements. This office does not award fellowships, scholarships, or other financial assistance for study at Santa Clara or elsewhere.

The center also offers support for faculty through faculty development programs such as workshops on teaching and confidential individual evaluations of teaching.

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Facilities

Adobe Lodge

Adobe Lodge is the oldest building on campus. Restored in 1981 to its 1822 decor, the Lodge contains a presidential dining room as well as central and private dining facilities for faculty and staff.

Benson Memorial Center

The Robert F. Benson Memorial Center is the hub of campus life. The Benson Center is designed to meet the various needs of students, faculty, staff, alumni, and guests and to provide an environment for the education of the whole person that continues outside the classroom. Among the many services and facilities available are the Information Desk, Game Room, Brass Rail Cafe, Benson Cafeteria, Bronco Corral, Shapell Lounge, a convenience grocery store, parlors, and Williman Room. Also housed in the building are the bookstore and post office, in addition to a number of student services offices and the offices of Campus Ministry and Associated Students.

Classroom Buildings

Nine classroom buildings house not only some 72 classrooms but numerous administrative offices as well. Mayer Theatre and three Fine Arts buildings also provide special classroom, rehearsal, and performance facilities.

Computing Facilities

Santa Clara provides both mainframe and personal computing facilities to support educational programs. Free noncredit short courses for both types of computers are offered periodically. Computer labs are typically open from 9:00 a.m. to midnight Monday through Friday, with hours slightly reduced on weekends.

The principal academic mainframe system is a Digital Equipment Corporation VAX-8650 running under the VMS operating system. There is also a VAX-11/750 running under the UNIX operating system. Approximately 75 terminals, located at three centers around campus, can access either of these machines. Both systems operate 24 hours per day, and student access through dial-up ports is also available.

PCs are concentrated in three general-purpose laboratories containing 140 IBM machines and various software packages for word processing, spreadsheet and data-base applications, and programming. Each of these PCs can also function as a terminal to the VAXes. An additional 90 IBM PCs are contained in three special-purpose classrooms: the English Writing Lab, Business School PC Classroom, and Engineering PC CAD Lab. Ten PCs and two ATs are located in three smaller clusters serving the Chemistry, Mathematics, and Physics departments.

The School of Engineering operates an advanced graphics workstation facility containing 50 Hewlett-Packard 9000/320 computer systems with high-resolution color displays. These machines are located in two classroom facilities (20 systems each) and five engineering laboratories, and are used for computer-aided design (CAD), computer graphics, and software development by all four engineering disciplines.

Most of the academic computers are connected by an Ethernet local area network (LAN) that provides high-speed communications between the various systems. The VAX-8650 is also a node on the BITNET wide-area network, providing students and faculty with electronic mail and file-transfer connections to over 200 institutions in the United States, as well as others in Canada, Europe, and Japan.

To encourage integration of computing into the curriculum in all disciplines, the University has made over 150 IBM PCs available to faculty in every academic department.

Cowell Health Center

Cowell Health Center offers health services to students (see page 252). The Cowell Building also houses the Public Safety Office and the University Personnel Department.

de Saisset Museum

The de Saisset Museum includes American, European, African, and Oriental art, as well as historically important objects from the early days of Mission Santa Clara. In addition to its permanent collection, it features special exhibitions of traditional, modern, and contemporary art.

Museum hours are Tuesday through Friday, 10:00 a.m. to 5:00 p.m.; Saturday and Sunday, 1:00 p.m. to 5:00 p.m.

Kids on Campus

Kids on Campus is the University child care and preschool center for children of students, faculty, and staff members. The center is a cooperative under the supervision of a volunteer committee of parents with a small staff of paid employees and parent and student volunteers. It also used occasionally by students in psychology and education courses for practicum experiences. The preschoolers benefit from a carefully developed program designed to meet their interests and to prepare them for kingdergarten. Students are encouraged to visit the Kids on Campus facilities on the east side of the campus.

Leavey Activities Center

Leavey Activities Center is a widely used extracurricular outlet at Santa Clara. Since the construction of this approximately two acres of recreational facilities, the intramural and recreation programs have achieved 80 percent student participation and maintained a high level of interest in competition, recreation, and social activity.

Included in the center is the Toso Pavilion for basketball, as well as racquetball courts, a volleyball area, swimming pool, men's and women's locker rooms, weight training section, sauna, and steam rooms. With such facilities and activities, the Leavey Activities Center has fulfilled its design for use by students, faculty, and staff of the University. It also continues to serve as a setting for cultural and social events.

A monthly schedule of hours and activities is posted on the Leavey bulletin board. Students must present validated ID cards to an attendant upon entering.

Louis B. Mayer Theatre

The 500-seat Louis B. Mayer Theatre is designed to provide the traditional proscenium stage common to most theatres, as well as an orchestra pit and thrust elevators that can be raised or lowered electrically. In a remarkably simple procedure, a wall is moved, a few seats are relocated, and the main theatre is reoriented to a new dramatic form that extends the stage into the auditorium so that the audience surrounds the action on three sides.

Mayer Theatre also has a special floor constructed for dance, as well as a large movie screen and film projector.

The Fess Parker Studio Theatre, housed within the Mayer Theatre complex, has no fixed stage or seating. Its "black box" design, complete with movable catwalks, provides superb flexibility in an experimental setting.

Mission Santa Clara

Mission Church marks the historic heart of the University. Adjacent to the beautiful Mission Gardens, the Church holds regular liturgical and sacramental services and provides an open place for quiet reflection and prayer.

Nobili Hall

Nobili Hall provides on-campus housing for the University's Jesuit community. The four-story facility, named for John Nobili, first president of the college, contains a dining area and a chapel.

Michel Orradre Library

The Michel Orradre Library, with 116,000 square feet of space, has some 493,000 books and periodicals, more than 3,400 current periodical subscriptions, and 358,500 microforms. It is an official depository for both California state and U.S. government documents, which number some 274,000.

The library has an open-shelf plan and is open seven days a week for a total of 108 hours.

Holdings in biology, chemistry, and physics are maintained in the Science Library in the Edward Daly Science Center.

Detailed information regarding the use of the Michel Orradre Library is available in the *Library Handbook* published by the library staff.

Ricard Memorial Observatory

Named after Father Jerome S. Ricard, S.J., Santa Clara's "Padre of the Rains" who was most famous for his "sunspot theory" of weather forecasting, the observatory now houses all of the University's audio-visual equipment.

Buck Shaw Stadium

Built in 1962 for Santa Clara's varsity football, baseball, and soccer programs, the 10,000-seat stadium and the surrounding practice fields are the outdoor facilities for Santa Clara's highly successful intercollegiate and intramural athletic programs.

Student Housing

The student residence halls and apartment complexes, described on pages 248–249, offer students a variety of choices in their University housing, from the close-to-campus apartment life to on-campus living. The facilities include several recreational areas for dances and events, outdoor swimming pools, and Santa Clara's student radio station.

Accreditations and Memberships

ONE HUNDRED AND THIRTY-NINTH YEAR
1989–90

Accredited by the Accrediting Commission for Senior Colleges and Universities of the Western Association of Schools and Colleges

Accredited by the American Assembly of Collegiate Schools of Business (Undergraduate and Graduate Programs)

Accredited by the American Bar Association

Admitted to Membership in the Association of American Law Schools

Accredited by the State Bar of California

Accredited by the Accreditation Board for Engineering and Technology (Undergraduate Civil, Computer, Electrical, and Mechanical Engineering)

Approved by the California State Commission on Teacher Credentialing

Accredited by the American Chemical Society

Admitted to Membership in the National Association of Schools of Music

Admitted to Membership in the National Association of Schools of Theatre

Accredited by the American Association of Museums

Member of the American Council on Education

Member of the Council of Graduate Schools in the United States

Member of the American Council of Learned Societies

Member of the Association of Jesuit Colleges and Universities

Member of the Conference of Western Law Schools

Member of the College Entrance Examination Board

Member of the Association of American Colleges

Member of the Association of Independent California Colleges and Universities

Member of the Council for Advancement and Support of Education

Institutional Member of the American Mathematical Society

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Member of the Western Association of Graduate Schools

Member of the Law School Admission Council

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SANTA CLARA UNIVERSITY
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Alumni Science Hall
Daly Science Center
De Saisset Musaum
Law House
Shermen St
Homestead Rd.
Mayer Theater
O'Connor Hall
Nobili Hall Jesuit Residence
Mission Santa Clara
Adobe Lodge Faculty Club
Mission Gardens
St. Joseph's Hall
Lafeyette St
Varsi Hall
Admissions
Donohoe Alumni House
Ricard Memorial Observatory
Santa Clara St
MAIN GATE
Palm Dr
Walsh Building Administration
Staff Lounge
Heafey Law Library
Bergin Hall School of Law
Leavey School of Business and Administration
Kenne Hall
The Alameda
Bannan Classroom Building
Sullivan Engineering Center
Michel Orradre Library
Tennis Courts
Field House
Buck Shaw Stadium
Campbell Ave
Physical Plant Facility
University Day Care Center
Leavey Activities Center
Cowell Student Health Center
Public Safety Personnel Office
Bellomy St
Campisi
Graham Residence Center
Sanfilippo
Music/Dance/Fine Arts Building
Walsh Hall
McLaughlin Hall
Kennedy Mall
Dunne Hall
Benjamin Swig Hall
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